Textile industries.

NO TITLE-PAGE & INDEX ISSUED

COTTON

Volume LXXXI
Number One
Ten Cents a Copy

NOVEMBER, 1916

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Dalton, and Atlanta, Ga.

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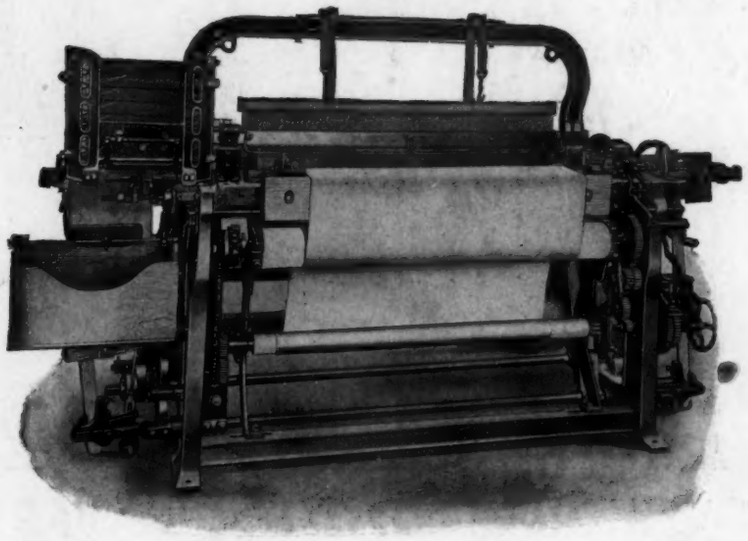


THE "IDEAL" Automatic Loom stands for low operating cost and high quality of fabrics.

It has the widest scope of any automatic loom and can be easily changed over from one fabric to another.

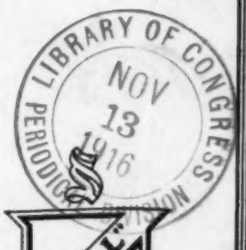
Weavers run up to 30 looms each.

Write for our illustrated catalogue.

The Stafford Company

Readville, Mass.

Fred H. White, Southern Agent, Charlotte, N. C.



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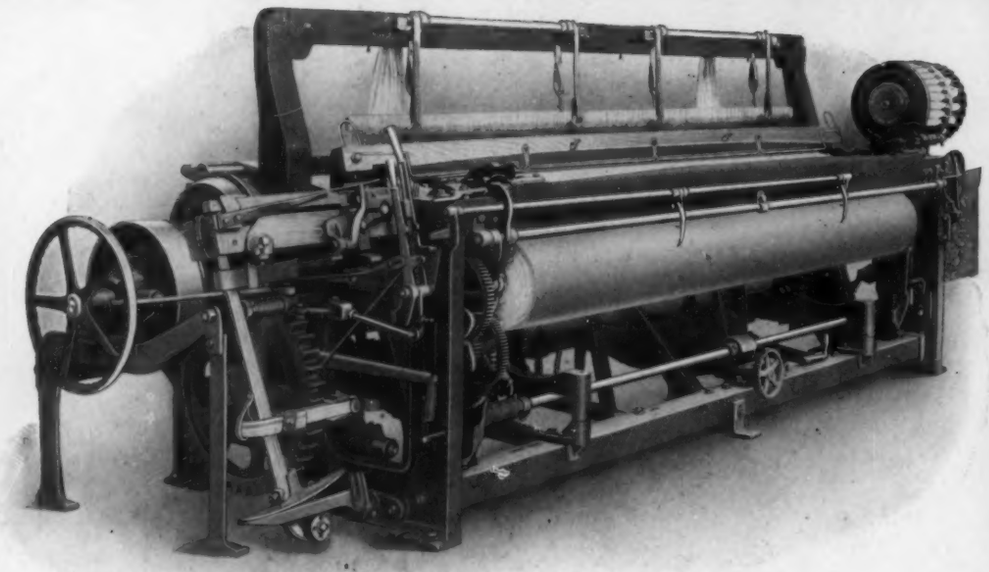
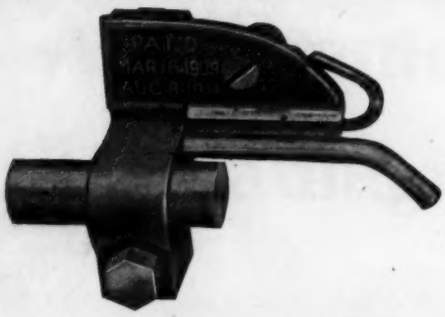


THE HIGHER THE WAGES
AND THE SCARCER OR MORE
INEXPERIENCED THE WEAVERS
THE GREATER ARE
THE
PROPORTIONAL ADVANTAGES
OF
NORTHROP AUTOMATIC LOOMS
TRADE-MARK REGISTERED

DRAPER COMPANY
HOPEDALE MASSACHUSETTS

J. D. CLOUDMAN Southern Agent
188 So. Forsyth St. ATLANTA GEORGIA

Copyright 1916 by Draper Company



The MacColl Patent Spooler Guide

will, with a much more open setting, remove slubs or bunches that would pass through other spooler guides;

it will allow small piecings and knots which are unobjectionable to pass through;

it will pluck loose slubs and imperfections from the yarn without breaking holding the slubs etc. in the teeth until they are cleaned

it is easily set cleaned and adjusted;

as it works with a larger opening it requires less frequent adjusting than other guides.

On worsted yarns the production in after processes is greatly increased as the yarn is delivered practically free from slubs and it is unnecessary to stop continually to remove these imperfections.

DRAPER COMPANY

HOPEDALE MASS.

J. D. CLOUDMAN Southern Agt. 188 So. Forsyth St. ATLANTA GA.

Copyright 1916 by Draper Company

The Light of a Better Day

In this space in the December issue of COTTON a new light will be described. It is not an electric, gas nor sun-light. It *is*, however, *the light of a better day.*

Wadsworth, Howland & Co.
Boston, U. S. A.

For All 'Round Textile Haulage

What is the transportation situation right now at your mill—just what are you up against?

Is your hardest problem getting the raw materials from the freight house to the mills—hauling skeined yarns to the dye house—or bales of yarns back to the railroad again?

Or is it keeping your engine room supplied with coal—and the ashes moved away?

THE HALL TRUCK 2-3½-5 TON

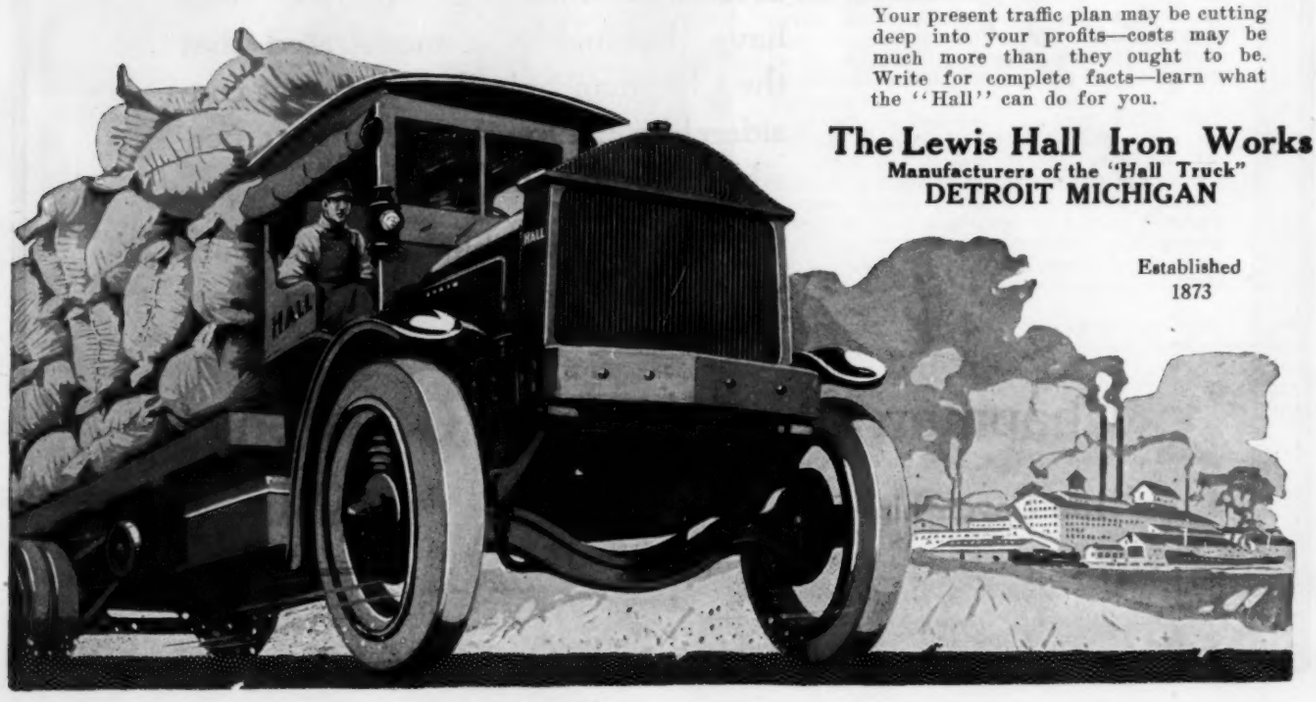
A Few Specifications

Continental Motor.
Timken Axles.
Gemmer Steering Gear.
Brown Lipe Transmission.

is built to handle the all 'round heavy haulage work of the textile mill.

The matchless Continental motor supplies an abundance of power to send capacity loads bounding up your hills and through your roughest roads. The construction of the truck throughout guarantees dependable day after day performance at a minimum of upkeep cost.

Write Textile Service Department for complete Facts.



Your present traffic plan may be cutting deep into your profits—costs may be much more than they ought to be. Write for complete facts—learn what the "Hall" can do for you.

The Lewis Hall Iron Works
Manufacturers of the "Hall Truck"
DETROIT MICHIGAN

Established 1873

More Than A Saving in Power

An absolute saving of 30 to 40 per cent of your Spinning Power is **only one** of the advantages of using the

Chapman Ball-Bearing Spindle

In addition to cutting down your power cost, you will get a more uniform yarn—a stronger yarn—run with lighter belts,—and save ends down.

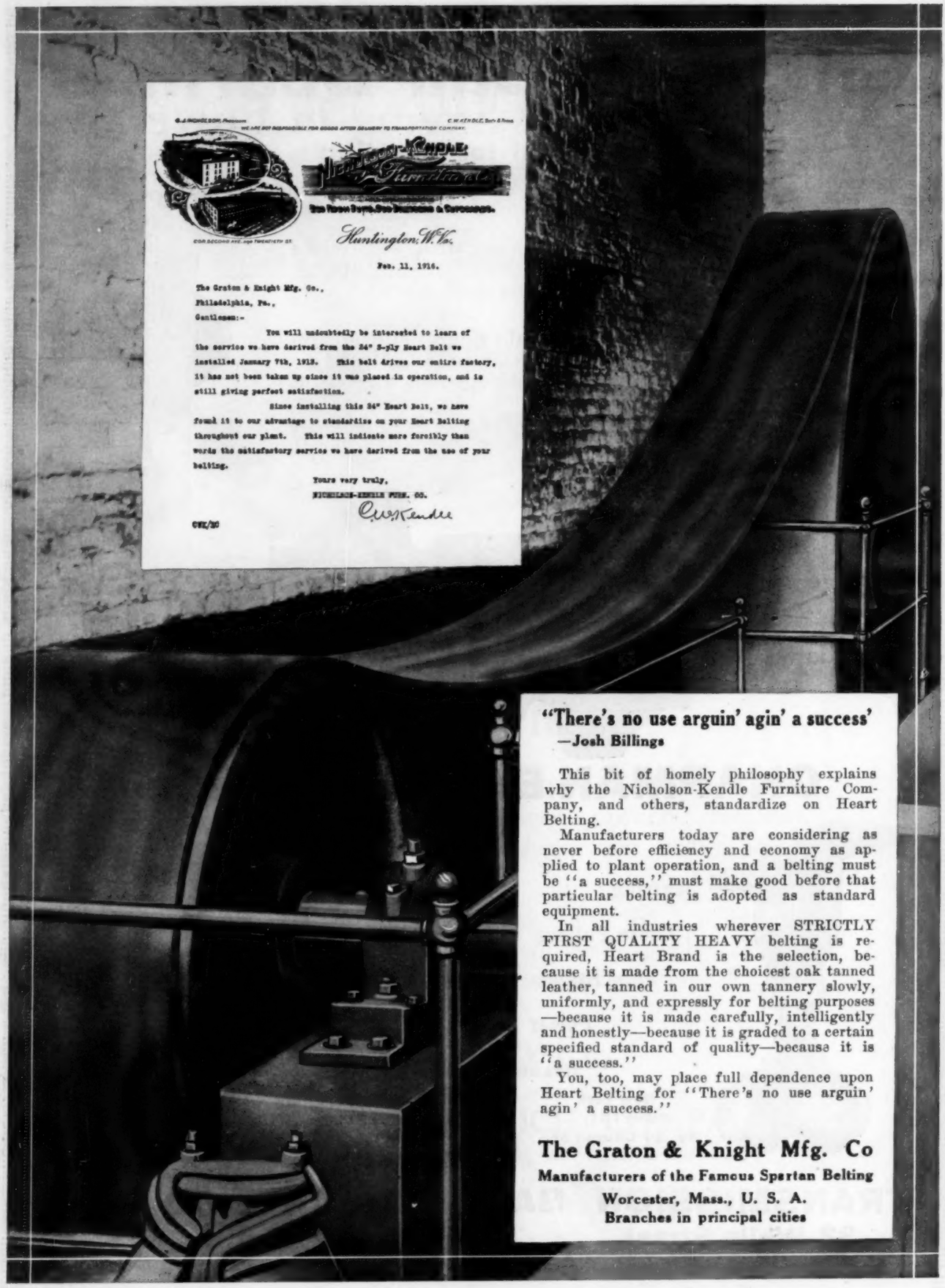
And you can drive Chapman Ball-Bearing Spindles at 15,000, 20,000 or 25,000 revolutions per minute—tests have thoroughly demonstrated that the Chapman Spindle will run at considerably higher speeds than are possible on your spinning frames.

Without any obligation upon your part, we'd like to talk it over with you.

Chapman Manufacturing Company

185 Devonshire St. **Boston, Mass.**

85-3


Nicholson-Kendle Furniture Co.
Huntington, W. Va.
Feb. 11, 1916.
The Graton & Knight Mfg. Co.,
Philadelphia, Pa.,
Gentlemen:-
You will undoubtedly be interested to learn of the service we have derived from the 24" S-ply Heart Belt we installed January 7th, 1913. This belt drives our entire factory, it has not been taken up since it was placed in operation, and is still giving perfect satisfaction.
Since installing this 24" Heart Belt, we have found it to our advantage to standardize on your Heart Belting throughout our plant. This will indicate more forcibly than words the satisfactory service we have derived from the use of your belting.
Yours very truly,
NICHOLSON-KENDLE FURN. CO.
C.W. Kendle
CWK/JC

"There's no use arguin' agin' a success'
—Josh Billings

This bit of homely philosophy explains why the Nicholson-Kendle Furniture Company, and others, standardize on Heart Belting.

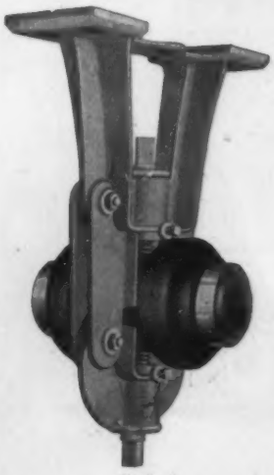
Manufacturers today are considering as never before efficiency and economy as applied to plant operation, and a belting must be "a success," must make good before that particular belting is adopted as standard equipment.

In all industries wherever STRICTLY FIRST QUALITY HEAVY belting is required, Heart Brand is the selection, because it is made from the choicest oak tanned leather, tanned in our own tannery slowly, uniformly, and expressly for belting purposes —because it is made carefully, intelligently and honestly—because it is graded to a certain specified standard of quality—because it is "a success."

You, too, may place full dependence upon Heart Belting for "There's no use arguin' agin' a success."

The Graton & Knight Mfg. Co
Manufacturers of the Famous Spartan Belting
Worcester, Mass., U. S. A.
Branches in principal cities

Chapman Ball Bearings

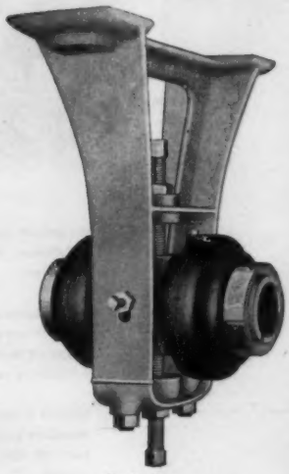


Style A

Designed for Shafting

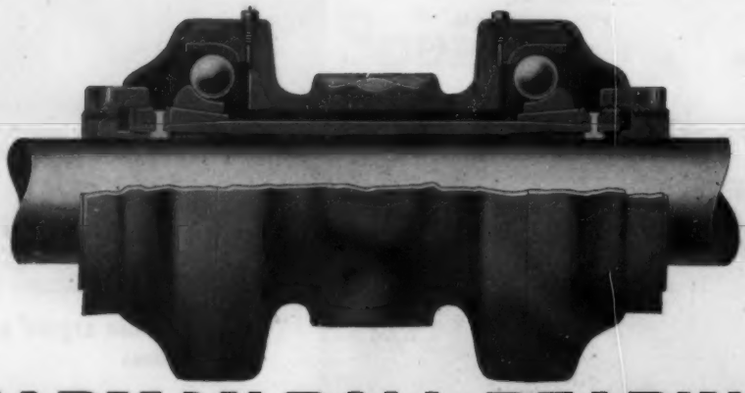
will fit any standard hanger frame, and are interchangeable with self oiling boxes of the same shaft size.

You can obtain more uniform product and eliminate oil-spoiled goods at a decreased cost for power by using



Style B

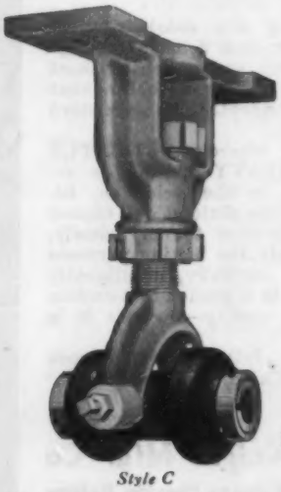
Save 75% Friction



Reduce 95% Lubrication

CHAPMAN BALL BEARINGS

for



Style C

Shafting — Counter Shafting

Loose Pulleys — Friction Clutches

Mule Stands — Guide Pulleys

Power Tables, etc.

Style D

BRANCH OFFICES

New York
Room 101,
No. 30 Church St.

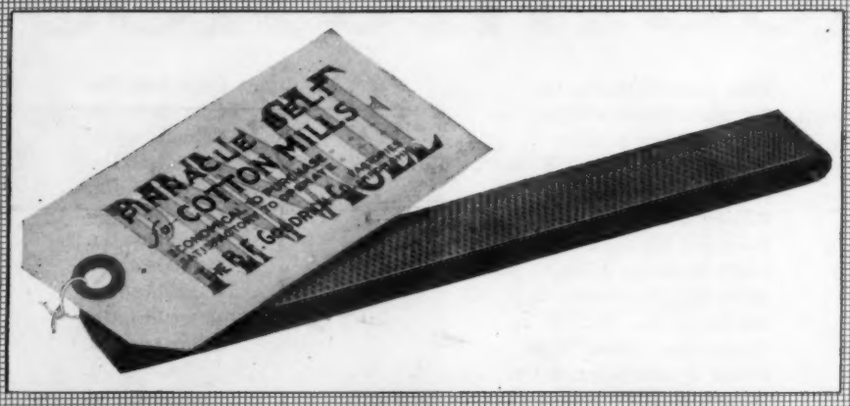
Philadelphia
Bourse Building

TRANSMISSION BALL BEARING CO., Inc.

32 Wells Street — Buffalo, N. Y.

Chapman Double Ball Bearing Co., Ltd., 339-351 Sorauren Ave., Toronto, Ont.

Have you hired this Cotton Mill Worker Yet?



Pinnacle Rubber Belt for Cotton Mills

Used on 80% of all cotton mill drives — all main and counter shaft drives, openers, breakers, cards, spoolers, warpers, slashers, and heavy looms where friction drives are used.

It costs barely 40% of the cost of leather and operates on the above named drives every bit as well as leather. If high belting costs are an item of worry to you, try Pinnacle.

Write for sample today

THE B. F. GOODRICH COMPANY

Makers of the Celebrated Goodrich Automobile Tires—*"Best in the Long Run"*

Factories:
AKRON, OHIO

Branches and Distributors in All Districts

These Cotton Mills Use Our Electric Power

Bibb Manufacturing Co.	Columbus, Ga.
Columbus Manufacturing Co.	Columbus, Ga.
Eagle & Phenix Mills	Columbus, Ga.
Georgia Manufacturing Co.	Columbus, Ga.
Perkins Hosiery Mills	Columbus, Ga.
Massey Hosiery Mills	Columbus, Ga.
Muscogee Manufacturing Co.	Columbus, Ga.
Swift Spinning Mills	Columbus, Ga.
Swift Manufacturing Co.	Columbus, Ga.
Meritas Mills	Columbus, Ga.
Hamburger Cotton Mills	Columbus, Ga.
Julius Friedlaender & Co.	Columbus, Ga.
Industrial High School (Textile Dept.)	Columbus, Ga.
Fairfax Mills	West Point, Ga.
West Point Manufacturing Co.	West Point, Ga.
International Cotton Duck Co.	La Grange, Ga.
Park Cotton Mill	La Grange, Ga.
Dixie Cotton Mills	La Grange, Ga.
International Cotton Duck Co.	Hogansville, Ga.
Grantville Hosiery Mills	Grantville, Ga.
Newnan Cotton Mills No. 1	Newnan, Ga.
Newnan Cotton Mills No. 2	East Newnan, Ga.
McIntosh Mills	Newnan, Ga.

If you care to investigate ask them for their reasons and opinions.

We also supply Electric Power to many other kinds of manufacturing industries and are prepared to furnish reliable information regarding power problems.

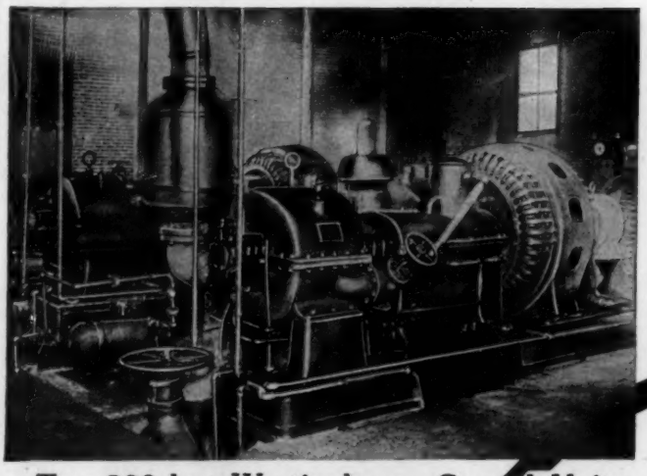
The Columbus Power Company

Columbus, Georgia

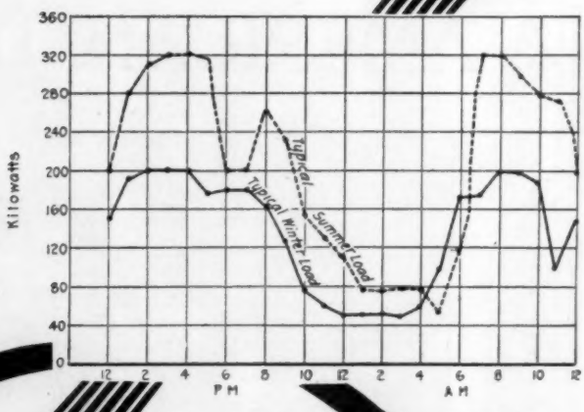
SUB-STATIONS
West Point
La Grange
Newnan

BRANCH LINES
Grantville
Hogansville
Trimble
Moreland

Extraordinary Economies



Two 300 kw. Westinghouse Geared Units. Hoopeston (Ill.) Gas & Electric Co.



Typical Summer and Winter Loads carried by the Hoopeston, (Ill.) plant.

Westinghouse Geared Turbines

(See the July 8, 1916 Electrical World for a description of this plant.)

During the summer canning season, the two 300 kw. Westinghouse Geared Units in the Hoopeston plant operate between ¾ and full load, and during the winter between ¼ and ½ load.

The seasonal variations, as well as the extreme fluctuations in the daily load, are handled nicely by these Geared Units which secure economies at the lighter loads practically as good as those at full-load capacity.

Write for Leaflets 3869 and 3870.

Westinghouse Electric & Mfg. Co.
East Pittsburgh, Pa.

W WESTINGHOUSE ELECTRIC

at a Poor Load Factor

COTTON STORAGE

350,000 — BALES

HANDLED DURING SEASON OF 1915-16 AT

AMERICAN DOCK TERMINAL

CITY AND PORT OF NEW YORK

Lowest insurance and storage rates in the City and Port of New York obtained in modern concrete warehouses. Fully protected by Automatic Sprinklers. New York Cotton Exchange license. Bonded employees. Forty years' experience in Cotton Storage Business. Direct rail connection with all Trunk Lines. Illustrated booklet and rates on application to

AMERICAN DOCK COMPANY

Executive Office: 17 State Street, New York

"If you are not a patron of the American Dock Terminal, you should be."

Steelcrete

Build Permanent Safety Guards

that eliminate accidents.

A safety guard should be so strong that an employe cannot be injured by throwing the entire weight of the body against the guard. At the same time the guard must be of permanent construction and the cost of installation reasonable.

"Steelcrete" Guards fill all these requirements.

Write for the "Safety First" Handbook which will show you how to build safety guards that really safe-guard your pocketbook.

The Consolidated Expanded Metal Companies

BRADDOCK, PA.

Hurt Building, Atlanta, Ga.

Steelcrete TRADE MARK REGISTERED

Type "H" Ball-Bearing Motors

are especially fitted to the requirements of cotton mill service because:

They are practically **frictionless,** due to their self-aligning ball bearings.

They need **little attention**—lubricate once in three to six months.

They are **clean.** No oil to drip or throw.

Note these features of the Type "H" Motor

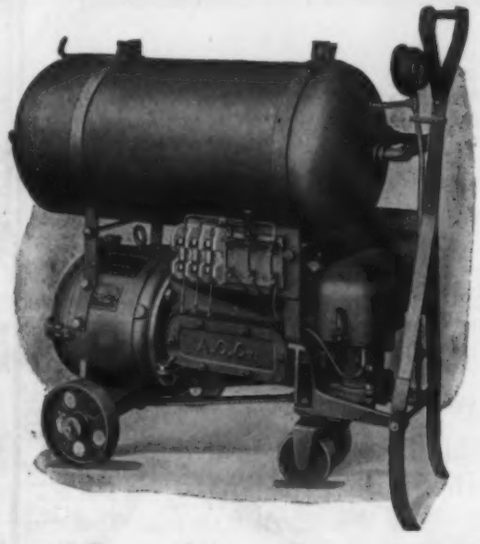
Feet cast solid with frame—No joints.

Solid metal rotor winding—without joints.

Fairbanks, Morse & Co.

Chicago **Atlanta** **Baltimore** **New York**

1490—9x



Portable Air Compressors

A Necessity for Cleaning Electrical Machinery in the Power House, Factory or Mill.

For Direct or Alternating Current

Type AC 3. Equipments—capacity, 13 cu. ft. Piston Displacement.

Allis-Chalmers Manufacturing Company

Milwaukee, Wisconsin

Canadian Representatives: Canadian Allis-Chalmers, Ltd., Toronto, Ont.

The Heart of an

ECONOMY

renewable cartridge

FUSE

Is the "Drop Out" Renewal Link. It is the only thing you have to replace in order to renew a blown ECONOMY FUSE. The expense is trifling, compared to the utter extravagance of discarding an entire fuse after it has operated.

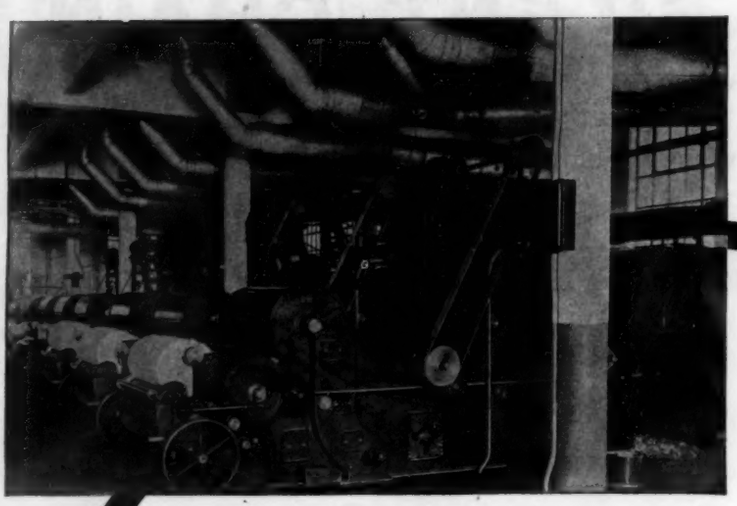
Use Economy Fuses in your plant and by their use cut yearly fuse maintenance bills a full 80 per cent.

Write for free Samples. Test them. Let the results speak for the economy and safety of Economy Fuses. Be sure to ask for Catalog 39.

Economy Fuse & Mfg. Co.

Kinzie and Orleans Sts., CHICAGO.

At Leading Jobbers.



Part of Naumkeag Steam Cotton Company's Picker Room, showing 7½ horse-power Westinghouse Type CS Picker Motors and Starters with overload and low voltage release. A frame drive on two-beater picker.

Westinghouse Steel Type Impregnated Picker Motor

Westinghouse Electric & Manufacturing Co.
East Pittsburgh, Pa.

Atlanta Boston Charlotte New York
Philadelphia Syracuse

W
WESTINGHOUSE ELECTRIC

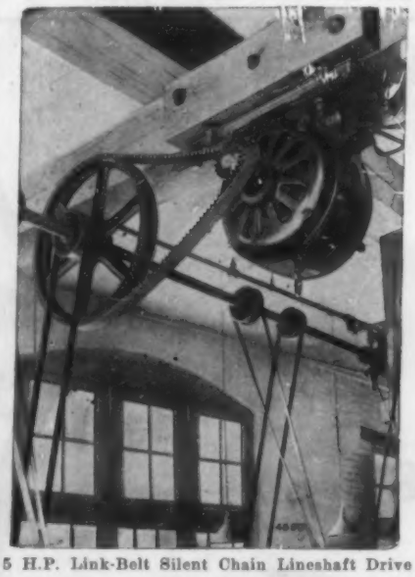
Westinghouse

The Ideal Drive for Lineshaft or Individual Machine

LINK-BELT SILENT CHAIN

Flexible as a Belt—Positive as a Gear—More Efficient than Either

Positive on short or long centers, 98.2% efficient, operates equally well in hot, cold, damp or oily places. Easily encased to safeguard mill workers.



5 H.P. Link-Belt Silent Chain Lineshaft Drive

Link-Belt Silent Chain makes electric motor drives easy to install on old machines, and transmits all the power to the machine. Wide ranges of speed ratios are available, utilizing standard speed motors in most Silent Chain Drives.

Write for Data Book No. 125, which explains Silent Chain Drives fully, and shows how to figure them, and determine prices.

LINK-BELT COMPANY

PHILADELPHIA		CHICAGO	
New York	299 Broadway	Louisville Ky.	F. Wehle, Starks Bldg.
Boston	49 Federal St.	Seattle	530 First Ave., S.
Pittsburgh	1501 Park Bldg.	Portland, Ore.	14th & Lovejoy Sts.
St. Louis	Central National Bank Bldg.	Los Angeles	161 N. Los Angeles St.
Buffalo	698 Ellicott Square	Denver	Lindrooth, Shubart & Co., Boston Bldg.
Cleveland	1304 Rockefeller Bldg.	San Francisco,	Meese & Gottfried Co., 660 Mission St.
Detroit	732 Dime Bank Bldg.	New Orleans,	Whitney Supply Co., 418 So. Peters St.
Wilkes-Barre	2nd Nat'l Bank Bldg.	Knoxville, Tenn.	D. T. Blakey, Empire Bldg.
Minneapolis	418 So. Third St.	Birmingham	D. T. Blakey, 309 American Trust Bldg.
		Charlotte, N. C.,	J. S. Cothran, Commercial Bank Bdg.

Toronto, Canadian Link-Belt Co., Ltd.

Machine Tools—Mill Supplies

and

Foundry Equipment

We represent the following companies:

Whiting Foundry Equipment Co.
Landis Bolt Cutters
Gould & Eberhardt Shapers and Gear Cutters
Lodge & Shipley Lathes
Cincinnati Bickford Upright and Radial Drills
Acme Turret Lathes
Blanchard Surface Grinders
South Bend Lathes
Skinner Lathes and Drill Chucks
Cincinnati Millers and Grinders
Cincinnati Planers and Boring Mills
Bullard Boring Mills and Vertical Turret Lathes
Cleveland Open Side Planers
Williams White Punches and Shears
Stoever Pipe Cutting Machines
Baker Bros. Drills and Keyseaters

High Class Line of

Belting
Hose
Packing
Pipe
Valves
Fittings
Elevating Machinery
Conveying Machinery
Power Transmission Machinery
Pumps
Air Compressors
Gas and Oil Engines

When in the market for apparatus manufactured by the above concerns, we guarantee you prompt service and absolute satisfaction. Let's get acquainted.

See list of stock on hand on page 182.

SEEGER-WALRAVEN CO.

28 West Alabama St., Atlanta, Ga.

Economy is Buying Wisely—Not Cheaply

Roofing Materials for Cotton Mills

Highest Quality

Moderate Price

Reliable Guarantee

Best Service

The quality of our Roofing materials is the best that men, money and machinery can make. This is proved by the thousands of Certain-teed roofs that have made good for many years.

By reason of our enormous output, (⅛ of all the roll roofings manufactured in America are made in our big mills) manufacturing and distributing expenses—and hence our selling prices—are reduced to the lowest minimum.

Those products which are guaranteed by us carry the responsibility of the largest Roofing and Building Paper concern in the world. All guess work is eliminated.

Our products are handled by good jobbers and dealers in all parts of the United States and Canada, and this distribution is supplemented by a system of warehouses located at important centers, which insures the best service and prompt delivery.

Certain-teed

Roll Roofing

Certain-teed Roofing in roll form is made in three thicknesses, 1-ply being guaranteed 5 years, 2-ply 10 years and 3-ply 15 years. Rolls are 32″ wide and contain 108 sq. ft. Nails, cement and full directions for laying are contained in the core of each roll. This roofing costs less than metal roofing, is spark-proof and fire retardant, and is absolutely weather-proof and water-proof. It is especially desirable for large Cotton Mills and is also used extensively for covering small houses and buildings of like character.

For flat roofs, we recommend a Certain-teed Construction Roof, which is a built-up roof consisting of two or more layers of Certain-teed Roofing cemented together in accordance with our specifications revised April 1, 1916.

Slate Surfaced Asphalt Shingles

Where good appearance is desired, we recommend the Shingle form of Certain-teed Roofing. These shingles are 8″ by 12¾″ and are put up in cartons, four of which are sufficient to cover 100 sq. ft. of roof surface. There are 424 shingles to the square which weighs 230 lbs.

These Shingles are guaranteed for 10 years. They are heavily surfaced with genuine crushed slate in red or green colors and no painting of any kind is necessary. They are spark-proof and fire retardant and are easier to lay and give a much better service than wood shingles.

Certain-teed Shingles cannot rot, crack, split or warp, and as each shingle is cut to a uniform size waste is eliminated and uniformity is secured in appearance.

Paint Products

ROOF COATING

Certain-teed Roof Coating is a permanent and weather-proof liquid, used for renewling the life of asphalt roofs. It penetrates thoroughly into the body of the roofing, and increases its life. It is put up in Bbls., Half Bbls., 5-gal. cans, and in boxes of 6 1-gal. cans.

PLASTIC ROOFING CEMENT

Being plastic in form this cement can be applied with a knife or trowel the same as putty and is used for repa'ring leaks and holes in asphalt, tar, metal or other roofing materials. It is put up in Bbls., Half Bbls., 50, 25 and 10 lb. cans, and in boxes of 36 1-lb cans.

OUT-DOOR PAINTS

These paints are furnished in Oxide Red, Moss Green and Bronze Green and are used for painting surfaces exposed to the weather, such as Cotton Mills, Factories, Warehouses, fences and other surfaces. They are especially desirable for metal roofs.

We also make a complete line of Wood Preservatives, Shingle Stains, Metal Paints, etc.

A complete catalog of our products will be mailed on request to purchasing agents or officers of Cotton Mills. Write our nearest Sales Office.

Richmond, Va., Sales Office:
Virginia Railway & Power Bldg.

Atlanta, Ga., Sales Office:
Healy Bldg.

GENERAL ROOFING MANUFACTURING COMPANY

World's Largest Manufacturers of Roofings and Building Papers

New York City	St. Louis	Pittsburgh	Milwaukee	Los Angeles	Seattle	Richmond	Duluth
Chicago	Boston	Detroit	Cincinnati	Minneapolis	Indianapolis	Des Moines	London
Philadelphia	Cleveland	San Francisco	New Orleans	Kansas City	Atlanta	Houston	Sydney

THE quality, strength and stability of Chattanooga Steel Tanks and Towers is recognized by engineers and architects throughout the country and attested by many mills and factories where we have installations, some of which are the largest in the country.

You never heard of a Chattanooga tank or tower leaking, collapsing or being blown down.

We design, manufacture and erect tanks and towers for every purpose. May we design one for your particular requirement and quote you our money-saving price? No obligation, just ask.

Other quality products of our manufacture include:

Steel Plate Work
Standpipes
Steel Riveted Pipe
Steel Work of Every Description.

Write for details and prices today

Chattanooga Boiler & Tank Company

Chattanooga Tennessee

The tank shown is one of our manufacture installed at the Crystal Springs Bleachery, Chickamauga, Georgia.

That Is Where You Lose Power

Whenever or Wherever Your Belt Slips You Are Losing Power.

You don't need to paint your belts with any sticky substance to make them run properly. Crown your pulleys with scrap leather, or even common cotton cloth placed in layers until you gain the desired effect.

AMENT'S IRON GLUE

will hold almost any substance to any surface for any reasonable length of time.

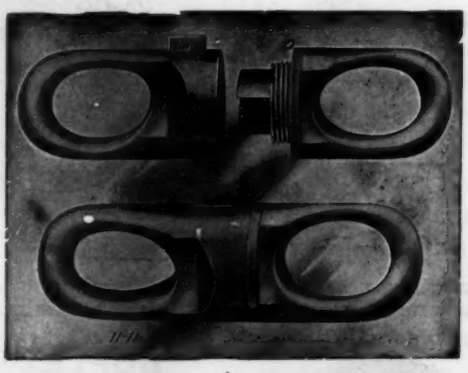
☛Send for Free Sample Today.

H. B. AMENT

608 Camp St., Louisville, Ky.

DON'T TAKE THE TIME

To cut out a piece of rope and resplice when a band on your English System rope drive stretches. By twisting this coupling you can control all stretch of rope.



Hunt Coupling Open and Closed.

Coupling ready for use.

Write for catalogue W-15-1 describing the coupling and "Stevedore" Transmission rope.

C. W. HUNT CO., Inc.

West New Brighton, N. Y., U. S. A.

61 Broadway, N. Y. City. Fisher Bldg., Chicago. Munsey Bldg., Washington.

There's *one* to every 33rd man

People do not always realize just what it means when we tell them that we have marketed about three million American Steel Split Pulleys.

The significance of these figures lies in the tremendously widespread use of this pulley.

When you compare that part of the population of the country *interested* in steel pulleys, with the total population, it looks like a mighty small factor—but when you consider that this small portion of all the people in the United States has bought so many "AMERICANS" that there is one to every 33rd person in the country, you will get some idea as to the magnitude of this business.

Definite points of merit, definite superiority in service, definite increase in value per dollar—these are some of the reasons why there is one "AMERICAN" Pulley to every 33rd man.

AMERICAN STEEL SPLIT PULLEY

Over 60,000 pulleys —3 in. to 120 in. in diameter — stocked at centers named below, and additional thousands stocked by over 200 dealers.

AMERICAN PULLEY CO.

4236-60 Wissahickon Ave. Philadelphia, U. S. A. New York—33-35 Greene St. Boston—165 Pearl St. Chicago—114-116 S. Clinton St. Seattle—536 First Ave., South.

For Efficiency and Economy

Use NIGRUM Bearings

You'll never have to stop your machine, due to the neglect of someone to properly oil it, providing you use NIGRUM Bearings.

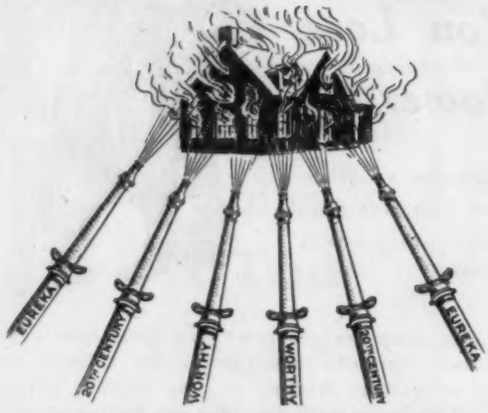
NIGRUM Bearings run smoothly and evenly without oil, grease or attention. They will save you money by saving you oil, and eliminate much of the wear and tear upon the working parts of the machine.

Write for Interesting Booklet, "Oil-less Bearings."

BOUND BROOK OIL-LESS BEARING CO.
10 Church St., BOUND BROOK, N. J.

All Genuine Graphited "Oil-less Bearings" have always been made at Bound Brook, N. J., in the United States of America.

EUREKA HOSE ON THE FIRST LINE OF FIRE DEFENSE



Not to properly equip buildings of either past or present-day type of construction with sufficient superior quality of linen or cotton rubber-lined hose is to invite combinations of circumstances which allow an insignificant blaze to develop into a serious fire, with the consequent inconvenience, annoyance and financial loss. Eureka Fire Hose, either Linen or Cotton Rubber-lined, is manufactured in the circular form water is intended to flow through it, and the interior and exterior surfaces are constantly under close scrutiny during the process of weaving, whereas in hose of other makes the flat weaving prevents imperfections being noted and remedied.

Eureka Fire Hose Mfg. Co. New York

Branches in all the principal cities in the United States and Canada

Better Results from Your Equipment

YOU may have been doing your work week after week in the same way, believing that you were getting the best possible results. But this is a mighty swift age and new methods of doing things are being invented day after day—methods which help you get better results from your boiler, your engine, your entire equipment.

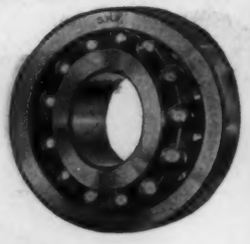
These are methods you should know about—they are always advertised and in such a way that it's a rare advertising page that will not yield one good suggestion to you.

Suppose you read the advertising pages of this issue thoroughly and see how many methods suggest themselves to you by which you could make a much better showing, by which you could save time and expense—then act.

WEST POINT IRON WORKS

S. K. F. Ball Bearings, ready to put on.

Also high-grade cotton mill castings.



Write us.

WEST POINT, GA.

Do you desire your employees to breathe Pure Air?

DUPLEX CONE FANS

have been designed to produce any pressure required in any plenum or exhaust system, the disc fan not being effective in many such installations.

Duplex Cone Fans are preferable to the commonly used centrifugal or enclosed blower fans, because of the small space required, and also the small initial and power maintenance cost.

Want Particulars? Ask them of

HOWARD & MORSE
45 Fulton St., New York

COTTON

Published Monthly by

W. R. C. Smith Publishing Co., Dalton and Atlanta, Ga.

L. L. ARNOLD, Editor.

Editorial and Advertising Departments, Grant Building, Atlanta, Ga. Subscription price, $1.00 for two years; Canada, $1.00 a year; Foreign, $1.50 a year. Entered at the Dalton, Ga., postoffice as second-class matter.

Contributions to the columns of Cotton are solicited and paid for after publication. The names of contributors need not necessarily be used, but must accompany all manuscripts.

Orders for any change in advertising must reach Atlanta previous to the tenth of the month preceding month of issue, otherwise publishers cannot be responsible for changes.

When changing address, *notify us*, not the postmaster. Always give the old address as well as the new one.

Copyright, 1916. W. R. C. Smith Publishing Co.

Volume 81. **Member Audit Bureau of Circulation.** **Number 1**

USING "COTTON" AS A TEXT BOOK.

During the past month, we have received the following letters from two well known colleges.

From a professor of textile engineering in a Texas college:

"We have a reading course of one hour a week and I feel sure that we have three articles from COTTON to each one from any other magazine.

"This year the college has adopted a plan to have an 'Assembly' of all the classes of each department to gather in department groups for an hour a week, and there have a program of general interest. Such articles as you publish will form a basis for a great many of these discussions."

From one of the departments of a college in Maine:

"A night school is being organized for the employees of the —— Cotton Mill. At the suggestion of the agent, I am writing to ask if you can send me a compilation of the section of your magazine headed 'Practical Problems Discussed by COTTON'S Readers.' We expect to use about fifteen instructors and should like to get a copy for each instructor."

BACK COPIES OF "COTTON" DESIRED.

"Would be glad to have you supply me with the following issues of COTTON if possible: November, 1909, December, 1910, March, 1911, April, 1911 and March, 1916; also the issue in which Mr. H. C. Wood discussed the compound on the fly frame in the latter part of 1913 or the early part of 1914. I am very anxious to secure the above copies of COTTON and will pay above standard prices for them in order to complete my files."

If any of the readers of COTTON have these copies, and desires to dispose of them, advise the Subscription Department.

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WHAT THE ADVERTISING PAGES MEAN TO YOU.

The trained experts of over two hundred organizations are constantly studying your problems and announcing the results of their investigations in the advertising pages of COTTON each month.

Through these investigations they are able to make suggestions that, if acted upon, will enable many manufacturers to run their plants at a greater profit.

The installing of a new machine and new time and labor saving methods, the substituting of better equipment and supplies for those you are now using, may mean the turning into dividends of much that you are now spending in useless and inefficient operating expenses.

Read through the advertising pages of COTTON carefully each month. They are sure to contain suggestions that will interest you. You will find there announced the latest textile devices on the market. Taken as a whole, these pages represent one of the most complete textile Buyer's Guides available.

WE WELCOME YOUR CRITICISMS.

"I enclose herewith, my check for $1.50 to renew my subscription to COTTON for three years.

"As a practical paper, there is, in my estimation, nothing equal to COTTON and in the years in which I have been a subscriber I have profited by reading it.

"You will pardon a little criticism—".

In this way one of our readers starts his letter to COTTON. His criticisms were good.

We want your criticisms and suggestions as well as your compliments. To enable us to discuss the problems you are interested in—to make COTTON a journal of the greatest interest to YOU.

Don't Envy the Man Who Has Solved His Lubricating Problems.

HE USES

DIXON'S TICONDEROGA FLAKE GRAPHITE

The FLAKES fill in the ever-present microscopic irregularities on bearing surfaces, thereby removing the cause of friction. Oil alone cannot do this, but oil combined with the proper proportion of DIXON'S TICONDEROGA FLAKE GRAPHITE will prevent destructive metal-to-metal contact.

Result? Less oil required—lower frictional losses—no shut-downs for repairs.

Send at once for booklet No. 34-C.

Made in JERSEY CITY, N. J., by the

JOSEPH DIXON CRUCIBLE CO.

Established 1827. 7-39

Export Orders Financed and Shipments Promptly Executed

We assume all risk

Branches, managed by textile experts, in all foreign markets. Let us take charge of your export. All communications treated confidentially.

Foreign Department

Young-Smyth-Field Co.

The Smythfield Export Co.

1216 Arch St., Philadelphia

SUCCESSFUL SOUTHERN BOBBIN MAKERS

JORDAN MFG. CO., Monticello, Ga.

What is it worth to YOU?

Our Half Century of experience in making Raw Hide Loom Pickers

Raw hide is very difficult to work and only those who have had great experience with this material can handle it succesfully. Our nearly 50 years' experience in making raw hide loom pickers enables us to not only know the kind of hides which make the best pickers but also to know how to work the hide to produce the best results. In hide quality and in workmanship our pickers are as good as it is possible to produce.

Write us for Samples

GARLAND MFG. CO.

SACO, MAINE

TRADE MARK

Allen Safety Set Screws

Any length, point or thread. We make a specialty of short lengths.

Allen Socket Cap Screws

are very neat in appearance and exceedingly strong.

Send for Circular No. 21 and free sample for testing.

THE ALLEN MFG. CO., Hartford, Conn.

Peoples Life Bldg., Chicago, Ill.
173 Princess St., Manchester, England.

NOV 13 1916
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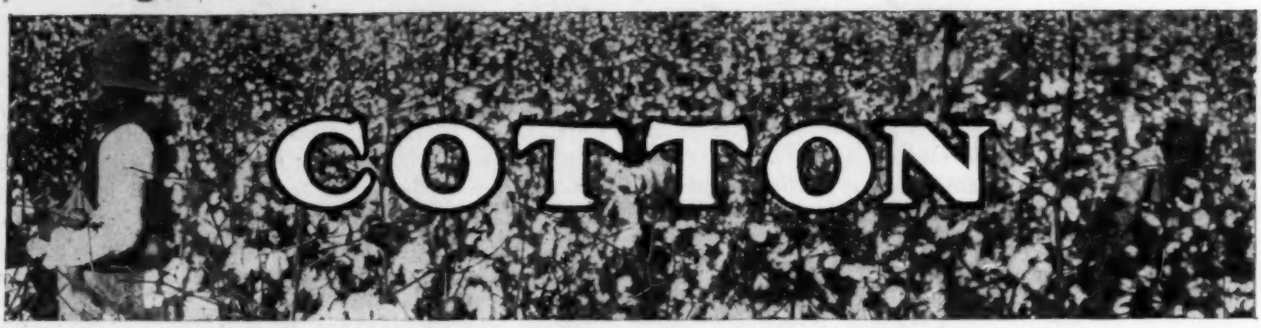


November, Nineteen-Sixteen.

The Spirit of Progress.

On Saturday, October 7th, the fourth annual Arcade-Victoria mill village fair was held at the Arcade Mill, Rock Hill, S. C. As in former years, it was again an unqualified success. A large warehouse, suitably decorated as an exhibition hall, was filled with exhibits typifying the many products produced by the mill workers, not only at their daily labors in the mill, but also during their leisure hours.

The wonderful display in the department of domestic art appealed to the eye, while the equally excellent exhibit in the domestic science section whetted the appetite for food. The artistic arrangement of the sunken garden with its decorations of pot and cut flowers, all grown in the village homes, indicated the trend of mind of the mill women, while in the men's garden section was every variety of seasonable vegetables, grown in the home gardens of the villagers. The mechanical arts, the work of the school children, the boy scouts' encampment and the kindergarten booth all demanded attention, while the demonstration exhibit of Winthrop College and the Federal Government, in charge of Miss Mary E. Frayser, was an excellent educational display. Dominating the entire exhibit was the spirit that was perhaps best illustrated by the allegorical arrangement of a miniature mill village, showing that the power generated in the home and working through the school and the church, is the power that moves the world. This exhibit was prepared by James L. Carbery, Special Agent of the Department of Agriculture and Clemson College in mill garden demonstration work.

To the visitor this spirit of co-operative effort, this individual interest in the success of the fair as an Arcade-Victoria proposition, was the most striking feature of the whole show. It was *their* fair. The exhibits were examples of *their* handicraft. The visitors were *their* friends and acquaintances, and the excellent barbecue was supplemented by pies, cakes and other good things from *their* individual dinner baskets brought from home. They were proud of their fair, and not without reason, for it exemplified the spirit of progress.

President W. J. Roddey, of the Victoria Mills, felt it, and in his address termed it the "Arcade-Victoria spirit." G. S. Escott, of the Mill News, from the fulness of his experience, called it the "Rock Hill spirit." Down here in Atlanta it is notable as the "Atlanta Spirit." These are but local appellations of the same great moving power for accomplishment—*the spirit of progress.*

This vital force cannot be defined. Its source cannot be located. It is something which pervades the people with a feeling of community interest; and its power of accomplishment is great. It has made Atlanta the most progressive and best known city in the whole South. It has brought Rock Hill its wonderful Winthrop College. It brought Greenville the first Southern textile exposition worthy of the name, and it is now bringing to that city a permanent exhibit hall where the big machinery show may be repeated. It brought to the Arcade and Victoria villages the inspiration of the village fair and the night schools, and it is making these a continually growing success.

These are but examples.

The spirit of progress is confined to no state, to no city, to no community. It needs only to be awakened to accomplish wonders. It makes no class distinctions, but infects everyone. It holds forth an inspiration to every community in every section. It is the power behind successful business institutions, associations, cities, nations. It is the prime-mover of the universe.

This was the lesson of the Arcade-Victoria fair.

The Knit Goods Embargo.

The British embargo on the import of cotton knit goods has created a great deal of discussion in and out of the newspapers.

Among the numerous reasons assigned for this action is that the intense competition of American knit goods was practically closing British factories. If this is the true solution, we can hardly blame our English friends for taking steps to protect their manufacturing industries, inasmuch as we are constantly urging our own government to furnish a protective tariff to such American industries as find it impossible to compete with foreign producers.

What effect, if any, this embargo will have on mills holding present orders on their books from British houses is not known. However, it does not seem likely that the future of the American industry will be permanently affected, as this business was only a part of the abnormal situation created by the war. The following figures, showing the total exports of knit goods from this country during the past six years, need no explaining, although worthy of careful study:

Fiscal year ending June 30, 1911	$ 1,646,219
Fiscal year ending June 30, 1912	1,858,836
Fiscal year ending June 30, 1913	2,613,806
Fiscal year ending June 30, 1914	2,546,822
Fiscal year ending June 30, 1915	13,080,445
Fiscal year ending June 30, 1916	20,856,114

The fact that nearly twelve million dollars of the nineteen sixteen exports will be cut off by this embargo should not greatly worry American manufacturers if they can hold the markets which produced the orders for the other nine million dollars. This amount is more than four times the knit goods exports of the country in normal years, and these markets may be induced to show further increases as American goods become better known.

The Proof.

Augusta, Georgia, is rapidly recovering from the four and one-half million dollar conflagration which devastated a part of the business and residence section last March. The homes now built and being built are of a substantial character, and are equipped with fire-resisting roofs. No efforts are being spared to prevent the re-occurrence of this costly lesson of nineteen sixteen.

Away out on the edge of the burned district near East Boundary, facing the forest of chimneys that remained, showered by the sparks and burning brands which destroyed its neighbors during those terrible hours, is located a little one-story shack that housed a soft drink establishment. Separated from the main conflagration only by a street of ordinary width, and flanked by the charred remains of other buildings, this frame structure still stands, mute evidence of the fire-resisting quality of its roof.

The Prize Contest.

The winner of the advertising contest prize for September, 1916, is Robert K. Eaton, assistant to agent, Cabot Manufacturing Co., Brunswick, Maine.

While, as already announced, no more revolution counters will be offered as prizes, the many contestants who have taken part in these contests will be interested to know that beginning with an early number of COTTON, another contest will be inaugurated. The prizes for these contests are already ordered, and as soon as received the contest announcement will be made. Watch for it.

The Winning Letter.

The advertisement of the Pyrene Mfg. Co., on page 591 of the September number of COTTON is undoubtedly the best in that issue, in my opinion. I give my reasons as follows:

(1) Being the only advertisement using color, it is most conspicuous.

(2) It attracts and holds the reader's attention.

(3) Photographs of unusual events such as shown in this advertisement are always noticed.

(4) The name of the article and its uses are not forgotten after the page is turned over.

(5) Being on the page opposite the "personals" it is probably read by more subscribers than any other advertisement.

(6) It is confined to just one article and its use.

One hour of close application to work—one hour of constructive thinking applied to the job in hand—is worth eight hours of time serving.

The Need of a Traffic Bureau.

In the August number of COTTON the subject of tariff making was considered and the very complete article by Capt. H. P. Meikleham, stressing the absolute need of a high class traffic manager by every cotton mill, called to mind. Some further facts from the general information bulletin of The American Commerce Association, Chicago, may tend to support the assertions made by previous writers and are, at least, worthy of consideration.

Please note carefully!

There are about 30,000 different important shipping points in the United States. If you should make a shipment of any commodity from Chicago to every other shipping point you would have 30,000 shipments. If you should make a shipment from New York City to every other point, you would have 30,000 more shipments, and if you continued this from every point in the United States to every other point in the United States, you would have 900,000,000 rate computations on one article.

The different classification schedules show that there are about 25,000 different items and descriptions of freight offered for transportation. If each of these articles should be shipped from every point in the United States to every other point, there would be 900,000,000 times 25,000 different freight rate computations and charges, a number so large that it is beyond comprehension.

Yet we have not taken into consideration the 43 Special Freight Service charges, such as milling-in-transit, elevation, lighterage, precooling, demurrage, and all of the other special services. When these are considered, together with the hundreds of different routes which may be used, the problem becomes almost inconceivable to the untrained man.

It is estimated that one tariff, published by the Southwestern Tariff Committee, contains more than 35,000,000 freight rates. This is only one of approximately 482,000 tariffs and supplements which are in effect at this time in the United States. One railroad, it is claimed, issued 186 tons of tariffs in one year. It is estimated that if all the tariffs were bound into volumes, they would make 4,000 volumes of 1,000 pages each, and that it would take 200 years to read them over once.

The rates in these tariffs were established to meet various commercial and traffic circumstances and conditions. The recent amendments to the Interstate Commerce Law made it unlawful for any railroad to charge a different rate than that published in the tariffs, or a rate that is unreasonable for the service rendered. Tens of thousands of rates are either too high or too low and should be adjusted. The records of the Interstate Commerce Commission show that in an average period of ten days the number of advances in freight rates was 15,000 and the number of reductions 29,000, making an average of 4,400 changes in freight rates every 24 hours.

Yet there are experienced mill men who insist that a clerk in their employ at $12.00 a week answers every purpose and that the use of the high class traffic manager employed by their state manufacturers' association is an expense they do not feel inclined to shoulder. However, a clerical error may cost a good deal of money. Here is an example:

The President of the Brown Manufacturing Company was seated before his mahogany roll-top desk.

"How is business?" inquired Mr. Jones, an old business associate, as he stepped into the office. "Have you secured the Northwestern contract yet?"

"No," replied Mr. Brown, "but I will bet you a new hat that we get it."

"Just then the telephone bell rang. "Is this the rate clerk of the A. B. Railroad?" inquired Mr. Brown. "What did you say that rate is on iron pipe?" "$3.50 a ton!" "Write me a letter to that effect, and please send it over by a messenger."

Mr. Brown turned to Jones and said: "The order is ours. With a $3.50 rate we can get into that territory and our competitors can't touch us." Mr. Brown pressed a button for his secretary and directed him to send a wire to Mr. Johnson, their salesman in the Northwest, instructing him to close the contract on a $3.50 freight rate.

The next morning when Mr. Brown returned to his office, he found a telegram reading: "Contract signed mailed tonight, Johnson." "I knew he would get it," commented Brown to himself, as he laid the telegram in his mail basket.

Shipments were then made as rapidly as the railroad could furnish cars. In the course of a few weeks all of the pipe was delivered in accordance with the contract.

As Mr. Brown was going over the paid freight bills one day, he noticed that on every shipment he had been charged $6.50 per ton, rather than $3.50, the rate quoted by the railroad. He called his secretary. "What does this mean? I understood the freight rate quoted us was $3.50." "That is right," replied the secretary. "I am sure of it. I will get the correspondence. Yes, here it is—$3.50 per ton."

"This will make a difference of about $3,000. It will take all of our profits," complained Mr. Brown. Then he wrote a letter to the railroad asking for an explanation and demanded a check at once for $3,000 to cover the alleged overcharge.

In a few days Mr. Brown received from the railroad company an answer, stating that they were very sorry to inform him that the clerk quoting the rate had made a mistake; that the legal rate from point of origin to destination was $6.50 per ton in accordance with tariff on file with the Interstate Commerce Commission, and that no other rate could be applied on the shipment.

Mr. Brown replied to the railroad company that whenever employes in his office made blunders in quoting prices the company had to stand the loss, and that he would expect a check for $3,000 by return mail.

After a voluminous correspondence it was finally agreed that the railroad company would refund the money, provided the Interstate Commerce Commission would approve the $3.50 rate. When Mr. Brown received this letter he threw up both hands in consternation and called in his secretary. "I cannot see what the Interstate Commerce Law has to do with the railroad refunding to us the money it owes us," said Mr. Brown.

"I have been talking with a traffic expert," said the secretary, "and he tells me that Section 6 of the Interstate Commerce Law states:

" 'The railroad shall not receive a greater or less or different compensation for the transportation of property or for a service in connection therewith or between the points named in the tariffs than the rates and charges which are specified in the tariffs filed and in effect at the time with the Interstate Commerce Commission.'

"The railroad, therefore, Mr. Brown, has no authority to refund this money, because it would be in the nature of a rebate, and rebating is punishable by fine or imprisonment. As the law requires that all rates must be published and filed in accordance with provisions of the Interstate Commerce Law, before they become effective, giving due notice to every one, both shipper and railroad alike must abide by the law, and should employ efficient traffic men to interpret the tariffs. They must know what rates are subject to the publication clause of the law and which are not. They must act with legal authority."

Now turn back to the files of COTTON for January, 1915, and note the following from the article of Captain Meikleham:

"The shipper, or manufacturer may make a sale or secure a contract based on certain rates quoted him by the carrier's representative, which are less than the published tariff rate, but these rates will not and cannot be protected unless correct as per the published tariffs, hense, they may cause considerable loss and inconvenience to the shipper who sells or buys the goods delivered, based on an erroneous rate quoted him by the carrier's agent. It frequently happens that different and conflicting rates are quoted on the same article by different railroad representatives at the same station. Many of these agents are inexperienced in rate matters and do not always have the proper tariff or facilities for giving correct information to shippers. As an illustration I quote from the the experience of a large shipper who requested rates from several different railroads, on a certain commodity in carloads, as follows:

"'Please quote me rate on —— carloads, Charleston, S. C., to Little Rock, Ark.' He received the following replies:

"(a) 'Beg to quote rate at 43c per 100 pounds on —— carloads, Charleston, S. C., to Little Rock, Ark., minimum 36,000 pounds, as per Leland's S. W. Lines Tariff, ICC 961.'

"(b) 'Rate on —— Charleston, S. C., to Little Rock, Ark., 30 cents carload minimum 40,000 pounds.'

"(c) 'Rate on —— Charleston, S. C., to Little Rock, Ark., 31 cents per 100 pounds, carload minimum 40,000 pounds.'

"(d) 'Rate on —— carloads, minimum 38,000 pounds, Charleston, S. C., to Little Rock, Ark., 20 cents per 100 pounds as per Leland's ICC 961.'

"(e) 'Rate on —— carloads, minimum 40,000 pounds, Charleston, S. C., to Little Rock, Ark., 26 cents per 100 pounds, applies via Memphis.'

"(f) 'Rate on —— carloads, Charleston, S. C., to Little Rock, Ark., 26 cents per 100 pounds.'

"(g) 'Rate on —— carloads, minimum 38,000 pounds, Charleston, S. C., to Little Rock, Ark., 20 cents per 100 pounds as per Leland's ICC 961.'

"(h) 'Rate on —— carloads, minimum 40,000 pounds, Charleston, S. C., to Little Rock, Ark., 39 cents per 100 pounds, applies via Memphis.'

"Quotations (a) and (b) are from the same railroad but different offices. Quotations (e) and (f) are also from different offices of the same railroad. Please note that these rates are quoted in Leland's Tariff by different representatives of railroads. The correct rate on the commodity, was 20 cents per 100 pounds.

"The illustration given shows plainly what different constructions may be placed on some of the tariffs by the representatives of different carriers .

"The railroad tariffs are not compiled and published so that an ordinary business man or shipper can understand them. Just as well expect him to interpret or understand the law which governs a particular case, without the assistance and advice of a lawyer, as to be ble to pick up a freight tariff, and the proper tariff, too, and quote the correct rate on his shipment."

When Congress passed the law making the railroad tariffs the freight rate laws of the country, controlling the profits and the selling prices of practically all articles of commerce, a new profession — Interstate Commerce — was born. Here, then, lies the reason why expert traffic men are needed. This is why the several state manufacturers' associations have established Traffic Bureaus and placed them in the charge of selected managers with years of railroad experience. And this is also the reason why every manufacturer should co-operate by making his company an active member. He cannot afford to do otherwise. It is business insurance.

Southern Textile Convention.

The Program Committee has announced the following program for the two-day convention of the Southern Textile Association, to be held at the Jefferson Hotel, Columbia, S. C., on Friday and Saturday, November 17th and 18th

Friday's meeting called to order at 11 a. m.

Saturday's meetng called to order at 10 a. m.

The meeting Friday morning will be called to order by W. P. Hamrick, Chairman of the Arrangement and Entertainment Committee, and will be opened by a prayer by one of the leading divines of Columbia.

Address of Welcome on Behalf of City, by Mayor L. A. Griffith, of Columbia.

Address of Welcome on Behalf of Manufacturers, by Irving Southworth, Agent, Pacific Mills, Hampton Mills Department, Columbia.

Meeting turned over to Frank E. Heymer, President.

Response to Address of Welcome, by John A. McFalls, Superintendent Dilling Cotton Mills, Kings Mountain, N. C.

President's Address, Frank E. Heymer, Alexander City, Ala.

Paper on "Picking and Carding," by C. C. Brigman, Overseer of Spinning, Pacific Mills, Hampton Mills Department, Olympia Plant, Columbia, S. C.

Paper on "Spinning," by T. M. McEntire, Superintendent, Loray Mills, Gastonia, N. C.

Paper on "Weaving," by A. D. Martin, Weaver, Clinton Mills, Clinton, S. C.

Paper on "The Small Things in Manufacturing," by I. B. Covington, Superintendent, the Florence Mills, Forest City, N. C.

A full discussion of each of the subjects is earnestly desired. This discussion will follow the reading of each one. After the formal papers, the business session will receive attention.

The foregoing program will be divided between the two days' session, in such a manner as seems most convenient to the officials in charge.

Those proposing to attend may be interested in the following schedule of trains arriving at Columbia, S. C.:

9:00 a. m.—Southern from Charlotte, N. C.
10:00 a. m.—Southern from Charlotte, N. C.
10:00 a. m.—Southern from Augusta, Ga.
12:15 a. m.—Southern from Charleston, S. C., and Orangeburg, S. C.
6:55 a. m.—Southern from Charleston, S. C., and Orangeburg, S. C.
11:15 a. m.—C. & W. C. from Greenville, S. C., stops at Gervais Street crossing.
2:15 p. m.—Southern from Greenville, S. C.
2:30 p. m.—Southern from Spartanburg, S. C.

Parties desiring to come from Spartanburg, S. C., can leave Spartanburg early in the morning on the C. & W. C., making connection at Laurens, S. C., reaching Columbia at 11:15 a. m. Parties coming from Raleigh, Rockingham and points in eastern North Carolina can come in over the Seaboard, reaching Columbia at 11:30 a. m.

Continual criticism is a poor method of obtaining good results from employees. The better conditions under which a man labors the better work he will do.

Cotton Situation in Germany.

The cotton spinning and weaving industry in and around Muenchen-Gladbach is much less employed than it was this time last year. War orders are not nearly so large as a year ago, because the military authorities seem to have supplies on hand which now need only to be supplemented and replaced. There is practically no work for civilian needs on account of the lack of raw material not subject to confiscation.

The prices of cotton three-cylinder yarns made of American fibre prevailing at Muenchen-Gladbach in July were per avoirdupois pound, f. o. b. mill: Cops, No. 24 English, extra, $0.407 to $0.411; No. 20, $0.385 to $0.394; No. 16, $0.379 to $0.387; No. 12, $0.374 to $0.383; Nos. 4 to 10, $0.37 to $0.379. For yarns of American fibre mixed with other, but at least one-third American, No. 20, $0.372 per pound. For yarns less than one-third American, also yarns of East Indian or similar fibre, and yarns with the addition of linters, artificial cotton, and other fibres not cotton, No. 20, $0.359 per pound on cops. Coarser yarns are correspondingly cheaper.

The following maximum prices per pound were quoted in July for raw materials: Raw cotton—fully middling, American, $0.286; Bengal fine, $0.227. Cotton waste—American and Egyptian strips and combings, 0.216 to $0.248; linters, $0.194. By reason of the scarcity of raw material and the high cost of yarns, prices for finished cotton goods are high, but the demand remains good for all classes of tricot, woven and knit articles.

The Crefelder Baumwollspinnerei Actien Gesellschaft earned a dividend of 8 per cent in 1915. At the meeting of the stockholders held some months ago it was stated that the mill is supplied with sufficient raw material to keep it going until the end of 1916, under present limitations as to working hours and use of material. The concern formerly used Egyptian raw cotton, but is now working American. It is producing yarns as fine as No. 140.

The question of substituting the metric system for the English system of numbering cotton yarns is being widely discussed in Germany. A committee of German cotton-spinning organizations, representing 96 per cent. of the 12,000,000 spindles in the Empire, met in January last and decided unanimously to recommend to the Imperial Government the introduction of the metric system of numbering yarns, allowing due time for effecting the change. To accomplish it Germany must produce the necessary machinery, and, therefore, it is argued, the change to the metric system should be made now, so that the machines can be built accordingly.

STATEMENT.

of the ownership, management, etc., of COTTON, published monthly at Dalton, Ga., required by the Act of August 24, 1912:

Editor, L. L. Arnold, Atlanta, Ga.

Business Manager, W. J. Rooke, Atlanta, Ga.

Publisher, W. R. C. Smith Publishing Company, Dalton, Ga., and Atlanta, Ga.

Owners—List of stockholders holding 1 per cent or more of total amount of stock: W. R. C. Smith, Atlanta, Ga.; J. Willett Smith, Hornell, N. Y.; W. S. Cushion, Cleveland, Ohio; O. A. Sharpless, Atlanta, Ga.; H. H. Kelley, Atlanta, Ga.; J. C. Martin, Atlanta, Ga.; L. L. Arnold, Atlanta, Ga.; W. J. Rooke, Atlanta, Ga.

There are no bondholders, mortgagees or other security holders.

W. R. C. SMITH PUBLISHING COMPANY,
W. J. Rooke, Business Manager.

Sworn to and subscribed before me this 2nd day of October, 1916.
JOHN C. MARTIN,
(Seal) Notary Public.
(My commission expires June 29, 1920.)

Mill Village Roofs and Roofing

Before the dawn of history, Nature had taught man the need for some suitable habitation as a protection against the elements. Just how long a time elapsed before these places of residence began to assume some pretensions of architectural ability is not known, but Chaldea, Egypt, Phoenicia and China were the first countries of record where artchitecture worthy of the name made its appearance.

With the construction of buildings as distinguished from the natural cave or excavations of the Cliff Dweller type, also began the roofing troubles of the human race. The simplest roof constructions of history were those primitive flat roofs of the Orient, made with cross beams and thatch. The fact that these roofs did not always shed water caused the people to later further reinforce the roof with a heavy layer of stamped clay.

In Central Syria and in Egypt important buildings were roofed with enormous beams and slabs of stone. The Greeks employed a low-pitched gable roof, carried by simple trusses of wood and covered with marble or terra cotta tiles. The Romans were the first to span broad halls with vaults and domes of brick or concrete, covered probably with cement and lead for protection from the rain; they also used roofs carried by elaborate timber trusses and covered with tiles or with bronze plates.

It was in the mediaeval cathedrals that the system was developed of an inner covering or ceiling of stone vaulting, with an outer protective roof of timber trusses sheathed with boards and covered with some sort of an impenetrable material to turn the rain; these roofs were of very steep pitch. At the same time, there were built many roofs without stone vaulting and with the timber trusses exposed to view and decorated, the spaces between these timbers being often richly paneled.

Since the renaissance it has been customary to hide the roof behind a decorative ceiling of plaster. On the other hand, however, the external roof has received much more attention.

Shingles.

The word shingle is a Middle English corruption of *schindle,* originally a kind of wooden tile, generally oak, and these were used in places where timber was plentiful for roof covering. Sometimes they were made plain, but often with the ends rounded or pointed. As originally made in former generations, the wood shingle made an excellent roofing aside from the fire danger, for these shingles were split from the straight grained heart of the wood and air seasoned. Most of the wood shingles of today are sawed from stumps and frequently from waste lumber. They are kiln dried or baked rather than air dried, because of the necessity of saving time in manufacturing.

A roof is supposed to shed water; not to absorb it. Kiln-dried wood shingles, because they contain no sap, will soak up water, allowing the rafters and roof boards to become damp. On a shaded roof or a north exposure, they are likely to be permanently damp, causing a growth of moss, which tends to rot the shingles. In many cases the shingles will curl and split after a short period of service, partly because of uneven absorption of moisture. However, in these times the use of the wood shingle, particularly in thickly settled sections, is a decidedly dangerous practice. The danger of this class of roof covering was discussed at considerable length in the July Fire Prevention number of COTTON, and does not need further mention at this time.

Fire Resisting Roofs Demanded.

In the past few years a tremendous development has taken place in materials for roofing purposes. Many varieties and qualities have been placed upon the market, and it frequently becomes a burden to the busy manufacturer to select from among these many varieties a safe and economical roofing for mill village construction. Such a roof calls for vastly more than a material which is resistant to the weather. Experience decisively proves that no building is safer than its roofing, and that no roof built of inflammable material is safe. Modern construction, such as is adhered to by the wise manufacturer of these days and times, is rigid in its demand for a fire-resisting roof; a roof that not only resists the most severe weather for years, with little or no expense, but which also protects the building it covers from flying sparks and brands.

With the growing knowledge of the weakness of the wooden shingle many men of many minds began voluminous experiments for some class of roofing material to replace the roofing then popularly in use. Naturally, these new products followed along the same general plan as the wooden shingle, and there were soon placed upon the market the so-called asphalt shingles, metal shingles, asbestos shingles and tile and slate shingles. While tile and slate are not called shingles, they still adhere to the shingle idea, and might well be thus called.

Slate and Tile.

Under the heading of slate and terra cotta roofing tile, nothing need be said in this article because the cost of the material and its great weight necessitates a higher quality of construction than is usually placed in mill village houses, and they are, therefore, eliminated from consideration.

Asphalt Shingles and Ready Roofing.

These two forms of roof covering are considered under one head, because their methods of manufacture are the same, differing only in quality and style.

The basis of all roofing of this character is felt, and the raw material or basis of roofing felt is rags. The high-grade felt is made from cotton and woolen rags, and the cheaper felts are made with newspapers, cardboard, jute, straw and some rags. "Pure wool felt" is not used in any roofing by any manufacturer.

The rag business of the county is in full control of "Isaac, the Faithful," and when an old wool coat, for example, reaches the sorting rooms of the rag merchant, every thread of wool that can be readily cut from it, free from seams and buttons, is taken out and sold to the woolen mills, and finally through another "Isaac" reaches the consumer again as a fine all-wool garment. Whether wool, like the Hoo Hoo Cat, has nine lives, is not known, but only when it is useless for anything else, does it at last get into roofing stock.

A very competent roofing chemist is quoted as stating

that his records of felt tested show a range of from 12 to 18 per cent. wool fibre, with an average of between 14 and 15 per cent. in the best felt. It must not be assumed, however, that the absence of wool from felt is a detriment. On the contrary, the proper kind of cotton fibre makes a better felt for roofing. The prime requirement is a long, absorbent fibre loosely felted. That is, a soft, tender felt. Some fibres are not absorbent, such as those from burlaps, ropes, strings, canvas or any other fibres that make the felt of the hard kind. In good felt the fibres are long and soft and highly absorbent. Thus they will soak up heavy asphalt when melted, if given time enough to penetrate. Such a felt will absorb about one and one-half times its own weight in saturation.

After securing the proper quality of rags they are run first through a number of processes, which reduces them to pulp. This pulp is about as thick as hot maple syrup, and then is ready for the felt forming machine. These are immense machines, sometimes 240 feet in length, and of a character similar to paper machines. The felt pulp is suitably gathered from the solution form, spread upon a blanket, and later run through a series of rolls and over a series of drying cylinders until it is finally rolled up in the form of sheet felt. The thickness, or ply, of the felt is determined by the number of forming cylinders, but principally by the height to which the liquid pulp rises around the cylinders; the more nearly the liquid pulp covers the cylinders the thicker the felt. Some roofing factories manufacture their own felt, while others purchase the felt from factories who make a business of felt manufacture.

There are two principal processes in the manufacture of roofing of this character which may be called the single and the double process. Both processes are intended to accomplish the same purpose, viz., the suitable saturation and covering of the felt with those materials which are to render it impervious to water. Eliminating the technicalities, there is but one point to consider: The single or continuous process puts the coating on while the saturated felt is still hot, and in the same machine in which the felt is saturated, while in the double process the coating is put onto the saturated felt in a separate coating machine after the saturated felt has cooled. The single process man claims he secures a better union by putting the coating onto the hot saturated felt, while, in turn, the double process man claims that the coating will not stick to a hot surface nearly so well as to a cool surface. From the viewpoint of the user, this may be reduced to a matter of personal opinion, not materially affecting the durability of the roofing, other things being equal.

The Water Proofing Mixture.

Now we come to the water-proofing or saturating mixture, as it is called. This is usually composed of asphalt and asphaltic oils. However, in addition to these, we have coal tar, coal gas tar, water gas tar, those materials extracted from non-metallic minerals, as petroleum and those made from animal fat and vegetable oils.

There is a great difference in coating materials as there is in felts, and probably no roofing manufacturer uses any one to the exclusion of all others; indeed it would be wholly impracticable to use any one alone in the manufacture of this class of roofing. Furthermore, probably no manufacturer uses the same ingredients constantly or in the same proportion without variation. A brand of roofing is manufactured at a price, and this price is usually adhered to from year to year, regardless of the normal fluctuation of the market for raw material. Therefore, it frequently becomes necessary to find a substitute for some material formerly used, which has for some reason become scarce or higher in price, and in the selection of a substitute care must be taken to secure something that will produce the same finished results in the roofing, so that the user secures an article equally as good as that formerly presented. The object sought and usually attained by all manufacturers, is to maintain a uniform quality in the finished roofing and at the same time keep within a given price per ton for the cost of manufacture.

Some of the water-proofing material from petroleum is in the form of solids, or semi-solids. These have to be "cut" or "fluxed" by the use of the liquid water-proofing or oils, which, like the felt, are used almost without exception by roofing manufacturers. The addition of this oil to the solid matter melts it, or, in roofing talk, acts as a "flux" to the material. Through this material the felt is run as described, absorbing a certain proportion of the roofing oil, much as a blotter would absorb water.

The asphalts from petroleum are all very black and vary in hardness from that of butter to soft coal, but all dissolve in petroleum oil, or under heat. They are marketed under a variety of names, which mean little to the general reader. These solids, or semi-solids, as well as the flux oils, from 13 to 20 gravity, are used in many brands of roofing.

Waterproofing material, or natural asphalts, are also found as solids, or semi-solids, in mines or lakes. These materials have been in use at least since the oldest Egytian mummy was embalmed, for asphalt was the waterproofing used by the embalmers. The ancient name of the Dead Sea was *Lacus Asphalties*, from the asphalt that arising from the bottom was gathered and shipped to Egypt under the name of Jew's pitch.

Natural asphalt is found in many parts of the world, but by far the largest known supply is found around a line ten degrees north of the equator. Because of the phenomenal nature of the deposit, Trinidad Lake asphalt is perhaps more generally known than any of the others. This lake has an area of 127 acres and covers the top of a hill 138 1-2 feet above sea level. Numerous borings show the lake to be the crater of a volcano, and its shape not unlike an ordinary funnel. Borings in the center to the depth of 135 feet show the asphalt to be uniform. A most remarkable feature about this lake is that no matter how much asphalt is taken out, the holes fill up in a short time, leaving no trace of the digging. The filled funnel of asphalt seems to balance the upward flow, so that when ten tons are taken out at the top ten tons are pressed up from the bottom to restore the balance. This process has gone on for centuries and the quantity seems to be inexhaustible.

There is about 27 per cent volcanic ash in Trinidad asphalt. On this account it makes a most excellent roof coating in combination with other asphalt, but is not as a rule used in saturation. The purest known asphalt is mined 60 miles from Vernal, Utah, and is called Gilsonite. As mined, the lumps look like hard coal, while the slack has a red brown color. Under the heat of a lighted match

it runs in large stringy drops and large quantities of it are used in roofing.

Waterproofing pitches, made from animal and vegitable oils are also prepared and marketed under a variety of names. The leading soap manufacturers produce the domestic supply. These pitches are made from the refuse of soap grease, are black and look much like regular asphalt. Other vegetable coatings are imported, one source being the candle tar pitch, secured in the manufacture of candles from palm oil and similar substances.

The Surface Finish.

Many brands of roofing after completion are merely coated with soapstone or mica dust to prevent sticking in the rolls, while others are treated with a coating of asphalt on the top side and then a layer of crushed slate or terra cotta is applied under pressure. It is somewhat doubtful whether this stone coating has any appreciable effect on the wearing qualities of the roofing, but it does improve its appearance, and it doubtless aids in making it still more fire-resisting. The same material is also cut into various forms for shingle purposes and thus inherits the name shingle from its wooden prototype.

The question, "Is three-play roofing really more valuable than one-ply or two-ply?" is often asked. The best way to answer such a question is to take the figures for it. In one ply there are 10.13 pounds of felt, if No. 45 is used, while in three-ply, if No. 75 is used, there are 17.10 pounds of felt. Now, the felt itself is of no particular value to the roof except as a carrier of water-proofing and life-giving asphalt. Therefore, the more felt there is, the more asphalt it will carry. To illustrate, take a saturation of 130 per cent as a basis, which is a fair average, then the saturation of a one-ply would be 13.17 pounds of asphalt, while the saturation of a three-ply would be 130 per cent. of 17.10 pounds, or 22.23 pounds of asphalt saturation. Reduced to a percentage basis, the immense importance of the difference will be at once apparent, as the three-ply carries in the form of saturation over 66 per cent more than one-ply. The coatings are usually the same, regardless of the ply of the roofing, therefore, the greater value of the heavier weight is wholly in the larger quantities of asphalt they carry in the form of saturation of the felt itself.

Many roofing manufacturers furnish announcements concerning the various tests which have been made on their particular brand of products. These tests include bending, tearing, fire, smelling, acid, water and strength. Such tests usually amount to little from the standpoint of the user. For example, take the water test. All prepared roofing is waterproof when it is new. A pan formed of roofing will hold water. If made into a pan the waxed paper, in which a five-cent package of crackers is wrapped, will stand exactly the same test as the roofing. No water will soak into it or through it. However, thin waxed paper would hardly be purchased as a permanent cover for a building. What is desired is roofing that will *stay* waterproof. The best test is time.

Roofing Materials of Metal.

Under this head may be classed the metal shingles, the corrugated roofing sheets, and roofs of copper, tin and zinc.

The use of copper and zinc are practically eliminated from this discussion because of the necessary expense attached thereto, which is usually too great to consider for mill village construction. This leaves the metal shingle of tin stamped into innumerable patterns and forms and either painted or recovered with a galvanizing coat. These form handsome, light and fire-resisting roofs that are comparatively inexpensive. This class of material has also stood the test of time and a number of Southern mill villages today may be seen equipped with roofs of this character, as is the case with the asphalt shingles. Ornamental, inexpensive and permanent are the claims made by the metal shingle manufacturers, and the different brands of these products are equipped with a variety of locking devices to hold the shingles in place and at the same time allow for expansion and contraction, due to changes of temperature.

In the manufacture of the metal shingle the sheets of tin are cut into blanks of different sizes and re-squared on all sides. These blanks are then placed one at a time on powerful presses where the main design of the shingle is stamped into the tin. After this the pieces are passed along to other presses, where the side laps, bottom-over laps, top ridges or steps or other special locking devices are put on and then the nail holes are punched and the shingle is ready to be galvanized or painted.

In the galvanizing, the shingles after they are formed are immersed one by one in a bath of molten spelter. In this process the entire shingle is thoroughly and evenly coated, leaving no unprotected part to be infected by rust or corrosion. Such a method is considered superior to the making of shingles from galvanized sheets because of the liability of the galvanizing medium peeling off in the bending operations while the cut edges will also be unprotected and have a tendency to rust more easily.

In the painting of shingles each shingle is dipped into a tank of a suitable paint, giving it a thorough coating on both sides as well as in the folds of the lock. However, because of the tendency to be scratched during the rough handling of transportation and erection, it is advisable when using painted shingles to immediately give the roof a coat of paint as soon after it is completed as possible.

Where ornamental roofs are desired these metal shingles are frequently pressed into special forms to imitate tile and thus the opportunities for ornamentation are almost unlimited.

A still cheaper roof, although one that is not so attractive in appearance, is made by the use of corrugated steel roofing, which is usually galvanized. Inasmuch as this roofing is laid in large sheets, the labor cost for application is much less than in the case of the individual shingles. However, the appearance is equally unattractive.

Asbestos Roofing.

The indestructible mineral substance known as "Asbestos"—composed chiefly of silicic acid and magnesia—constitutes one of the most remarkable minerals with which science is acquainted, and while it has been known since the earliest times—for many thousands of years at least, prior to the dawn of the Christian era—it has been for the most part always prized either as an article of extreme luxury or as a most wonderful and interesting curiosity, devoid, however, of all practical utility.

The earlier Egyptians, under the dynasty of the Pharaohs, drawing their supplies from Greece, with the commerce of the Athenians, evidently created quite an industry in the manufacture of cere cloths, as many mummies have

been found wrapped in these garments, woven quite ten thousand years ago. One of the best preserved specimens of their earlier textiles may be seen in the Vatican library, it having been unearthed in Rome in the eighteenth century.

The spinning of asbestos for lamp wicks was one of the earlier uses to which this Grecian and Corsican asbestos was put, and the never-dying lamps of the Vestal Virgins are said to have been supplied with asbestos wicks. Both Strabo and Plutarch refer to these lamps as being perpetual, because of the wicks remaining unconsumed, while Pausanias, Pliny, Theophrastus and other Greek and Roman writers refer more or less constantly to both lamp wicks and napkins as being made of asbestos. Pliny in particular specifically describes asbestos napkins as being placed over the charcoal brazier, emerging from this treatment much fairer and whiter than they can be made by being washed with water, with subsequent bleaching through exposure to sunlight and air.

So well known was asbestos, as a non-heat-conducting clothing material in these early times, that it has been suggested that the three Magi which Biblical history described as having survived the ordeal of Nebuchadnezzer's fiery furnace, were effectually clothed in heavy asbestos cloths before the ordeal began. The famous traveler Marco Polo, whose travels through the Great Empire of Tartary in the thirteenth century commanded such world-wide attention, described asbestos cloth made of Siberian and Chinese asbestos, as well as its manner of manufacture. Even the great Charlemagne is said to have had both table cloth and napkins of asbestos cloth, so that our modern magazine advertising of asbestos table cloths has its antecedent prototype in the observations of the noted philosopher Pliny.

Asbestos is found in many parts of the world in many different forms. Its origin is probably volcanic, and while many theories have been advanced to account for its peculiar characteristics, the most generally accepted is that the deposit took shape during the prehistoric cooling of the earth's surface and that either water or steam is responsible for the dissolution of the primary formulation and for its rebuilding into its present fibrous form.

Crude asbestos, as mined, often contains impurities such as sand, rock, traces of iron, etc., and all of these must be removed before the actual manufacturing stage is reached. The best pieces are first "hand-cobbed," a treatment which removes all external impurities. Next the rock is put through a course of crushing, screening and blowing. This not only separates the impurities, but also roughly grades the asbestos fibre into fine and coarse, long and short, and eliminates the finer dust-like particles.

The finest appropriate fibres are used in asbestos roofing and these are selected with special care to insure uniformity of texture and the greatest possible tensile strength. The shorter fibres and powdered asbestos are used in making paints, cements and plasters.

The two great advantages of an asbestos roof are fireproofness and durability. It is a barrier to flying sparks and brands and the storms of winter and the heat of summer cannot affect it in any way. Asbestos is quite unchanged in the process of manufacturing, and when used as the basis for roofing, it retains its original powers of resistance to time, fire and weather.

Asbestos shingles are made from a mixture of Portland cement and asbestos fibre—giving both the protection and tensile strength of asbestos and the indestructibility of cement. This mixture is made with great care. The fibres of asbestos run in every direction—crossing and re-crossing—weaving and interweaving to form a firm matted foundation for the cement colloids. This interlacing of the fibres overcome the possibility of graining; consequently the shingle cannot warp, chip or split. Then this pasty mass of asbestos and cement is rolled out to shingle thickness and the water extracted under pressure—the shingles are pressed flat and absolutely smooth. This pressing removes all air pockets—and small holes where water or moisture could settle; a well made asbestos shingle being almost as smooth and impervious to water as a sheet of plate glass. They are made in three colors, gray, black, and red.

These shingles are usually laid by the "French" or "diagonal" method. The lines in such a roof run diagonally instead of horizontally. There are two common sizes of shingles: one 16 by 16 inches, which is laid 13 by 13 inches to the weather; and one 12 by 12 inches, which is laid 9½ by 9½ inches to the weather.

Asbestos shingles are also laid by the "American" or "square butt" method, but the cost is considerably more because more material is required in order to provide necessary headlap. The sizes are 8 by 16 inches, which is exposed 7 inches to the weather; and 6 by 12 inches, which is exposed 5 inches to the weather. In either case a 2 inch headlap is obtained.

An asbestos shingle roof laid "French" method will probably give as good service as the same material laid "American" method. Many people prefer the appearance of the "American" method roof, and for small residences and buildings particularly, the 16 by 16 inch "French" method shingles look quite large in proportion to the size of the building. They are better suited for large buildings that have big roof areas.

While asbestos shingles are non-inflammable, they are too heavy and expensive for the average mill village construction, weighing as much as 400 to 450 pounds per square when laid "American."

Asbestos is also made up in large corrugated sheets from four to ten feet long and approximately two feet wide, but probably this material is also too heavy for mill village work.

Still another type of asbestos roofing is the ready or built-up form. In the manufacture of this roofing, asbestos fibres are made into compact felts, which in turn, are thoroughly impregnated with natural asphalts, filling every void and coating every fibre. The felts are then cemented together with hot asphalt, thus forming a composite sheet consisting of two, three or four plies, as conditions demand. This construction assures a roofing which gives protection and permanence.

On pitched surfaces, this roofing is applied in ready-to-lay form, while on flat surfaces, or those with a pitch of six inches or less to the foot, the built-up form may be used. This roofing in built-up form is in three, four or five laminations as conditions demand, with broken joints. Each layer consists of a sheet of asbestos felt mopped with a hot natural asphalt compound. The result is a smooth sur-

faced roof built up so that all angles where unusual wear takes place are thoroughly reinforced.

In the selection of a suitable roofing material, the local conditions under which it will be used and the individual taste of the purchaser are also factors of prime importance which will enter largely into the final decision.

In conclusion, we wish to give credit to the following firms for their courtesy in furnishing the sources of information from which the facts in the foregoing article were taken:

General Roofing Manufacturing Company;
The Heppes Company;
The Flintkote Manufacturing Company;
The Cortright Metal Roofing Company;
The H. W. Johns-Manville Company;
Merchant and Evans Company;
Dominion Metal Products Corporation;
Wheeling Corrugating Company;
The Philip Carey Company;
Keasbey & Mattison Company;
The Western Elaterite Roofing Company;
The Elaborated Roofing Company;
The Barrett Company.

Oster Threading and Cutting-Off Machine.

The machine shown is one of a line of pipe and nipple machines developed by the Oster Manufacturing Company, 2068 East 61st Street, Cleveland, Ohio, to meet the demand for a pipe machine that would perform every one of the many pipe threading jobs ordinarily required around a mill, using pieces long or short, straight or bent, over or under size, nipples of any length, and all thread nipples.

The illustration shows the company's type 300-B machine for ¼ to 2 inch pipe. It is operated by a ¾ horsepower direct or alternating current, Westinghouse motor. The motor is mounted on the machine base and is direct connected. It has ample power and speed for all classes of work. Machines for from 1 to 4 inch pipe are operated by 1½ horsepower motors, for from 1¼ to 6 inch, by 1¾ horsepower motors, and for from 2½ to 8 inch pipe, by 2½ horsepower motors.

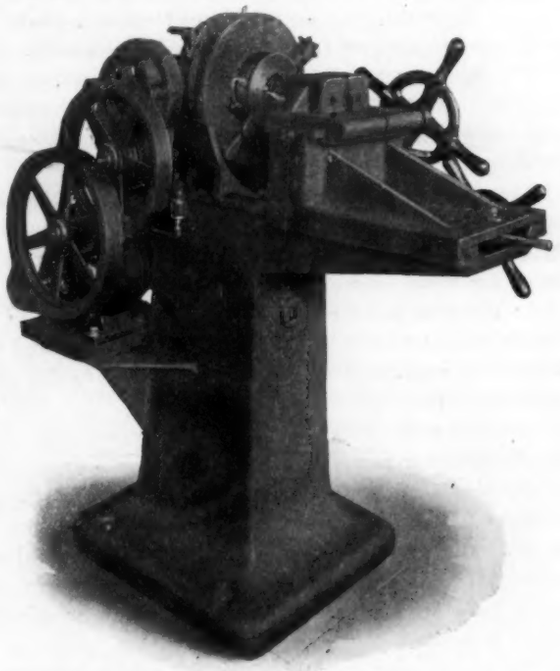
The type 300-B is a combination threading and cutting-off machine, a combination pipe, nipple and bolt machine. It will thread bolts from 7/16 to 1¼ inches. The regular standard equipment consists of motor, geared oil pump, automatic cut-off apparatus, automatic die release, and four sets of right hand pipe dies from ½ to 2 inches. The special features are the lever operating die head and the open type pipe vise which makes the machine a rapid producer.

One of the great advantages of the machine is the open type vise which enables the operator to change it quickly and thereby increase the capacity. Every operating part is right under the hand so that not a moment is wasted. Without changing his position the operator can see the work of the threading dies at all times. The vise grips the work by a single turn of the wheel, bringing it to an absolute center. All bearings have a large surface. The vise can be moved up close to the die head for threading short pieces, short bends, nipples, bolts, and casings.

The quick die release feature of the machine makes possible the opening of the dies at the instant the thread is finished. It opens the die gradually and removes the burr, leaving a clean, perfect thread. At the same time, the vise carrying the pipe is thrown back, withdrawing the pipe from the die head. This contributes to faster and more perfect work, and insures duplication of the length of thread. When adjusted for the length to be cut, it will repeat automatically without any attention on the part of the operator.

The threading dies are made with the proper rake. Each die is made to cut like a lathe tool. One set of dies will thread two or more sizes. They are made of a high grade carbon steel carefully tempered. The dies are controlled by a lever handle, and are opened or closed by one movement of the hand while the machine is in motion. When the thread is finished it is only necessary to trip the die lever and this opens the dies right off the work, without making it necessary to stop the machine.

For threading close nipples the machine may be equipped with two threading nipple holders which are attached to the front of the regular vise jaws by two bolts. The threaded



end of the nipple is held in these holders while cutting a thread on the other end. When the thread is cut, the vise jaws are opened by a half turn of the hand wheel and the nipple drops out.

The cutting off apparatus is operated automatically by means of a pawl attached to the frame of the machine. The cutter is set into the end of the sleeve and fastens with a set screw. The star wheel is attached to a long screw which operates the sleeve holding the cutter.

The oil pump is so arranged that no bolt or chains are necessary to drive it. It is connected direct to the gears of the machine and operates constantly while the machine is in motion, thus insuring a steady and constant flow of oil in the dies. It is a combination pump and works both ways, for right and left hand threading. The oil is contained in a reservoir within the base of the machine. The pump lifts the oil from the reservoir and floods the dies and cutters, when the oil is returned to the reservoir through a strainer. Thus the oil is used over and over.

Steam—In and Out of Slashers.

BY A. W. THOMPSON.*

This screed is about the proper use of steam in slashers specifically, and similar machines, such as drying cans, tentering machines, coil driers, in general.

Large diameters and thin shells expose machines of this type to great risk of damage from excessive pressure, or collapse from vacuum; necessary characteristics of the machine the builders cannot be blamed for.

I have seen the entire slasher department in a large mill put out of commission for ten days, with a damage of several thousand dollars to the equipment, to say nothing of the loss of production, by an excessive steam pressure probably lasting only a few seconds, all of which might easily have been prevented by properly safeguarding the steam supply.

No manufacturer will knowingly tolerate conditions which jeopardize important equipment to say nothing of the risk to operatives. Equally intolerable are conditions which prevent slashers from delivering to their entire productive capacity; yet in nearly every size room one finds conditions external to the machine which cause unnecessary losses in production, either by limiting the operating speed or by frequent stoppage.

The causes of such conditions are often quite obscure and each case differs in detail from any other; but it is my purpose in what follows to describe briefly the requirements for avoiding such undesirable conditions.

In the first place means for conducting steam to the slasher cylinders must be safe, of ample capacity, and well drained of condensation in order to respond to the maximum steam demand.

In the second place it is equally important that means be provided for removing the condensation corresponding to the maximum steam demand as fast as the steam is condensed. I do not think that this second requirement is as generally appreciated as is the first one, since inadequate traps and return pipes are often found where great pains have been apparently taken to secure an adequate steam supply.

Failure to meet these requirements results in a definite expense due to lost production, the amount and exact cost of which can be readily determined—but the fuel cost of drying is not generally appreciated. It is not uncommon to find mills using slashers which reject all of their condensation. If the expense thus incurred were as easily estimated as expenses due to loss in production it would not be tolerated.

It gets lost in the shuffle and disappears in the fuel account along with a multitude of other sins which the coal pile is always expected to cover.

Let us assume a mill with requirements calling for two slashers. The total boiler horsepower for such a mill will be approximately six hundred. Now the slashers alone will require an amount of steam corresponding to thirty-five boiler horsepower or six per cent of the total steam for the mill.

If their condensation is rejected about twenty per cent of the total heat in the steam is lost, corresponding to one per cent of the fuel account of the entire mill.

Let us now consider in detail some of the specific defects in equipment and methods of installation commonly found in slasher rooms and which are detrimental to safety, capacity and economy.

When using steam direct from the boilers, it is common practice to place a reducing valve in or near the boiler room, running a reduced pressure line at say 15 or 20 lbs. pressure to the slasher room, where the pressure is again reduced to the desired cylinder pressure by means of the small reducing valves which are commonly furnished by the builders with each slasher. Sometimes one large reducing valve is used for the final reducing of pressure.

Now the lever weighted type of reducing valve, so generally used, will regulate the pressure for a nearly constant flow of steam, very satisfactorily, but if the demand for steam fluctuates widely the resultant throttling cuts the valve seat so that the leakage, even when fully closed, becomes sufficient to build up an excessive pressure when the steam demand is small.

Disastrous explosions occur from a combination of failure in reducing valves and safety valve, which is readily explainable.

If the main reducing valve leaks, as above described, or sticks, which sometimes happens, the pressure in the line builds up, possibly to full boiler pressure. This throws upon the second reducing valve, or the individual slasher reducing valves, a duty which they were never designed to perform, causing a rapid rise in the steam pressure in the slasher cylinders.

If this rise in pressure is slight, the small safety valves which the slasher builder furnishes are capable of relieving it, provided they are not overweighted and in bad order—which is their normal condition in my experience.

If the excess of pressure is considerable, say five pounds or more, an explosion will surely result unless the total safety valve area is capable of discharging the full capacity of the reduced pressure line at the existing pressure.

If all but one or two slashers in a large room are shut down, the small relief offered by the valves on those in operation is clearly dangerously inadequate.

There is a tendency on the part of slasher operators to resort to other means than weighting the safety valve as above mentioned in the effort to increase the cylinder pressure and improve production, and it should be understood at the start that this is extremely poor practice. Ten pounds gauge pressure is ample for the best slasher production, provided the steam is dry, the supply ample and the drainage properly removed.

Whenever an increase of a pound or two in pressure is found to result in better production, the cause is due to increased circulation and more rapid removal of condensation. This indicates an original cause of poor circulation which should be located and removed at once.

The working pressure should be limited to 10 pounds, on account of the low margin of safety which necessarily exist in cylinder shells.

To eliminate the danger of high pressure a special type of regulating valve should be employed, or better still, two

(Continued on page 52.)

*Park's Piping Parables for October.

Mill Conditions and Market Reviews.

Southern Mill Situation.

Cotton manufacturing never moved at a quicker pace than at present. In spite of higher wage costs, higher material costs and a growing scarcity in operatives, the mills are turning out record productions and selling them at record prices.

The demand for all manufactured products is insatiable, and while high prices are complained of by the buyers, there is little evidence of a checking in the demand.

Many mills are operating on a double-shift schedule, and every effort is being made to force the machinery to produce more finished material in a given period. In this connection it is of interest to note that the superintendent of a Charlotte, N. C., mill is experimenting with a device which he believes will allow him to speed up his machinery to a point where night work will be avoided, at the same time greatly increasing his daylight production.

Those mill owners located in states where a workman's compensation act is now in operation will be interested in a case recently decided by the Supreme Judicial Court of Massachusetts. It appeared that a night watchman, while interfering to prevent the escape of supposed thieves, was mistakenly shot by an officer of the law, and his assistant engaged in trying to apprehend the thieves, who had robbed a post office. When shot he was not engaged in protecting his employer's property, which had not in fact been robbed, and he mistook the officers for robbers. The court held, in Re Harbroe, that the watchman could not be regarded as having been injured while in the course of his employment so as to entitle his representatives to recover for his death under the workmen's compensation act.

Coal shortages of a more or less serious nature are predicted in some quarters, and the dearth of cars on the railroads are, in many instances, restricting production at the mines.

The cotton speculator has the bit in his teeth and is bolting with the future market, while the boosters on spots are doing their best to keep a close second. The immediate end no man knoweth. The final end is certain. In the meantime, mills are not accepting many long-time or far distant delivery contracts. They are playing safe.

An order has been issued in the United States District Court at Orangeburg, S. C., by Judge H. A. M. Smith for the sale of the Orangeburg Manufacturing Company by its receivers on January 15, 1917. An upset price of $210,000 was placed on this mill property.

The William Goldsmith Company, of Greenville, S. C., has recently contracted with the Republic Cotton Mills at Great Falls, S. C., to build 100 operatives' cottages at Great Falls. These houses will be one and two-story cottages, with modern conveniences, including running water, bath room equipment, sewage system, electric lights, etc. J. E. Sirrine is the architect.

The new mill of the Hamilton Carhartt Company, to be located at Carhartt Station, a few miles above Rock Hill, S. C., and recently announced in these columns, has been contracted for by Sellers and Pargett, of Columbia, S. C.

T. C. Thompson and Brother, of Charlotte, N. C., who have the contract for the erection of the new 500-foot extension to the Cabarrus Mill, at Kannapolis, N. C., have broken ground for the new extension, and will push the work rapidly to completion. This completed mill will be more than 900 feet in length when completed.

The recent sale and re-organization of the Dixie Cotton Mills at LaGrange, Ga., has been completed and the mills incorporated with capital stock of $500,000 by Wm. H. Wellington, Boston, Mass.; Geo. H. Lanier, Lanett, Ala., and Horace S. Sears, Weston, Mass.

At a meeting of the directors of the Graniteville (S. C.) Manufacturing Company, recently a resolution was passed calling a meeting of the stockholders in Graniteville on November 6th. At this meeting, the assurance was given, that a definite plan of reorganization will be submitted to the stockholders. While this re-organization plan has not been worked out in such detail as to enable it to be given to the public, those engaged upon it will have it in complete shape in a reasonably short time. Judge H. A. M. Smith, of the United States District Court in Charleston, will be informed of this call.

Judge Smith is in charge of the property, handling it through Mr. Rhett, of Charleston, and Jacob Phinizy, of Augusta, the receivers. Judge Smith recently filed three new orders in the case of the Georgia Railroad Bank, et al, against the Graniteville Manufacturing Company, the first order relating to creditors holding contracts for sale of goods and whether or not such holders were entitled to damages. Judge Smith ruled that the breaches of contract alleged occurred both before and after the appointment of receivers, and the most of them after the appointment. He further ordered D. B. Galliland, as master, to take testimony on each claim of this nature. Another order was in the case of Haynes, Moorehouse and Woodford, claiming commissions of $3,887 on orders included in the contracts broken. The third order entitled Haynes, Moorehouse and Woodford to approve claims on commissions and aggregate business done from Augusta office of the company. Claim was made that the agent's contract was broken when the Graniteville Company sold more than $100,000 worth of goods in one year without paying commissions to the agents. As the amount of goods sold in one year was $148,000 in round figures the Haynes, Moorehouse and Woodford Company were entitled by the order to prove claim to the amount of $5,953 in commissions.

The creditors of the Graniteville Company have been pressing for the sale of the property, and in the absence of any plan of re-organization it has been understood that the court would send the mills to sale early in 1917. However, it is now understood that no action is to be taken to that end until the new movement looking to a reorganization has been given an opportunity to succeed.

An addition is being built to the plant of the Huss Manufacturing Company, Bessemer City, N. C., manufacturers of fine damasks. This addition will be 50x100 feet, two stories high. Stafford looms and other equipment will be added.

The establishment of a new mill for the manufacture of absorbent cotton and gauze is said to be contemplated by F. D. Spencer, of Charlotte, N. C.

A movement for the establishment of a cotton mill by local business men has begun at Lyerly, Ga.

It is reported that Fuller E. Callaway and associates at LaGrange, Ga., anticipate enlarging the Elm City Cotton Mill in the near future to a point which will practically double its capacity. The addition to the mill will be paid for out of the mill surplus, no additional stock being issued.

The Wampum Cotton Mills at Lincolnton, N. C., recently started night work. Several new cottages are being built to take care of the additional operatives needed.

The Fort Valley (Ga.) Cotton Mills are adding new spinning frames.

The Pauline Mills, at Kings Mountain, N. C., are adding wide and narrow looms and spinning frames to their present equipment.

The Belton (S. C.) Mills are adding some new Draper looms to their present equipment, making a total of 1,400 looms.

The Hamilton Carhartt Mills, at Rock Hill, S. C., are adding spinning frames and preparatory machinery.

It is reported that the Lockmore Mills at York, S. C., anticipate enlarging their mechanical equipment. The mill is now operating on double shift and a number of new operatives' houses have recently been erected to accommodate the increased operating force.

The use of sanitary sewage disposal outfits among the southern mills is becoming increasingly popular. Many installations have been mentioned in previous issues of COTTON, and among the mills that have recently installed the "Sanisep" system of sewage disposal, designed by the Cement Products Company, of Wilmington, N. C., are the following:

Bibb Manufacturing Company, Macon, Ga., Porterdale Mill No. 2, village equipment, Mill No. 1 having installed this system several months ago.

Hawthorn Spinning Mills, Clover, S. C., two large sewage disposal tanks.

West Point Manufacturing Company, West Point, Ga., Fairfax Mill, 6000-gallon sewage disposal tank and village equipment.

Riverdale Mills, River View, Ala., village equipment.

Gate City Cotton Mills, Atlanta, Ga., village equipment.

Springfield Cotton Mills, Laurinburg, N. C., village equipment.

Norwood Manufacturing Company, Norwood, N. C., village equipment.

Roanoke Mills Company, Roanoke Rapids, N. C., village equipment.

Also a large number of schools in North and South Carolina and Georgia.

The Ivey Mills Company, at Hickory, N. C., have just completed a new Y. M. C. A. building for its employees. This building is equipped with swimming-pool, shower baths, pressing club, barber shop and an auditorium.

At a recent meeting of the stockholders and directors of the Summerville (Ga.) Cotton Mills it was voted and the officers authorized to sell treasury stock of the corporation and use the proceeds for the building of such an addition and extension to the present mill as might seem best. This will mean more additions for Summerville. The same directors were chosen for the ensuing year, and the following officers elected: J. B. Taylor, president and treasurer; B. H. Edmondson, vice-president; E. N. Martin, secretary, and E. Montgomery, superintendent.

A. K. Laudau, formerly with the Saco-Pettee Shops, and W. Loeber Landau, formerly with the Proximity Mills, Greensboro, N. C., have purchased the stock of the Kohlmann family in the Kohlmann Cotton Mill and Manufacturing Company, of New Orleans. The mill has been operated at a profit the past three years, and is now sold ahead for seven months at a very good margin.

The Maginnis Cotton Mills at New Orleans are considering the installation of additional machinery to the extent of 10,000 spindles, 450 looms and preparatory equipment.

The Delta Cotton Mills, at McComb City, Miss., which has been idle for sometime past, has been started up by Walter H. Carter, of Moorhead, Miss., on 26's single yarns on beams for the Philadelphia market.

It is understood that the Morgan and Hamilton Company, at Nashville, Tenn., have taken over the Humbolt (Tenn.) Cotton Mills. This mill contains approximately 8,000 spnidles and 241 looms, and has been occupied in the manufacture of cotton bag goods. The main plant of the Morgan and Hamilton Company is located at Nashville.

It is reported that M. B. Melendy, who resigned as superintendent of the braiding department of the A. H. Rice Company, Pittsfield, Mass., is contemplating the starting of a mill on combed cotton yarns in Knoxville, Tenn.

The Dixie Cotton Linter Company, Memphis, Tenn., has been incorporated with $10,000 capital by J. N. Talley, George Day, A. E. Cummins and others.

It is announced that the management of the Judson Mill, Greenville, S. C., will shortly put into effect a plan for insuring its operatives through the Southeastern Life Insurance Company of Greenville. The company will carry an insurance policy on the life of every operative, the families of these operatives to be the sole beneficiaries.

New England Mill Situation.

It is a time of annual mill meetings in many of the New England textile centers, and the financial returns reported are better than anything seen since the boom period of 1907. Indeed, in many instances, the earnings are the largest reported by mills in more than a quarter of a century. Many extra dividends are being paid, some of which are merely to average up the lean years, but others are special extras, distributed from the abnormal profits of a most remarkable year. There has been an active rise in all mill stock values, the figures in a number of instances showing increases of 25 per cent since the first of January. Debts are being reduced and reserves increased, and taken all in all, it is a happy time for the mill stockholder.

The outlook for continued earnings is good, yet hardly as bright as it was some months ago when cotton values were lower. Today the mills are facing the necessity of buying raw cotton at values that have hardly been equaled since the early '70's, approximately beyond the memory of the present generation of manufacturers. The situation in mills using long staple cotton is worse than in

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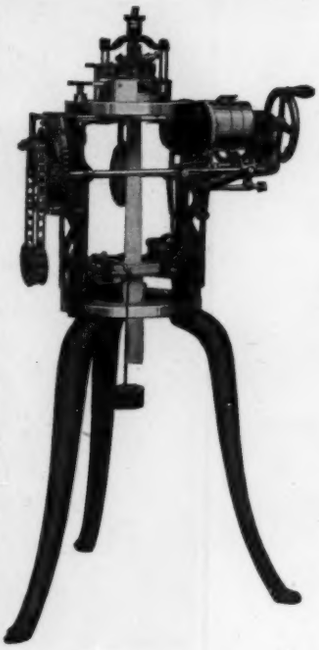

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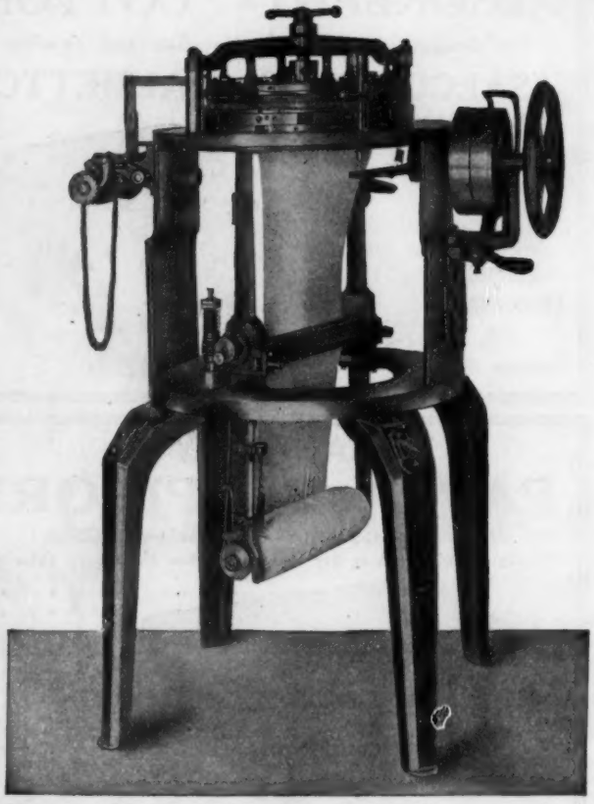

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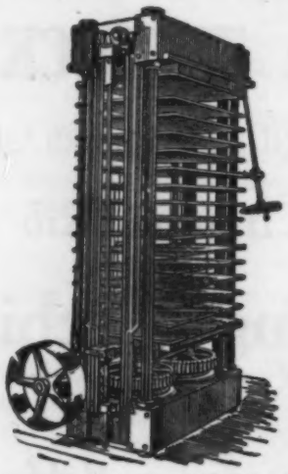

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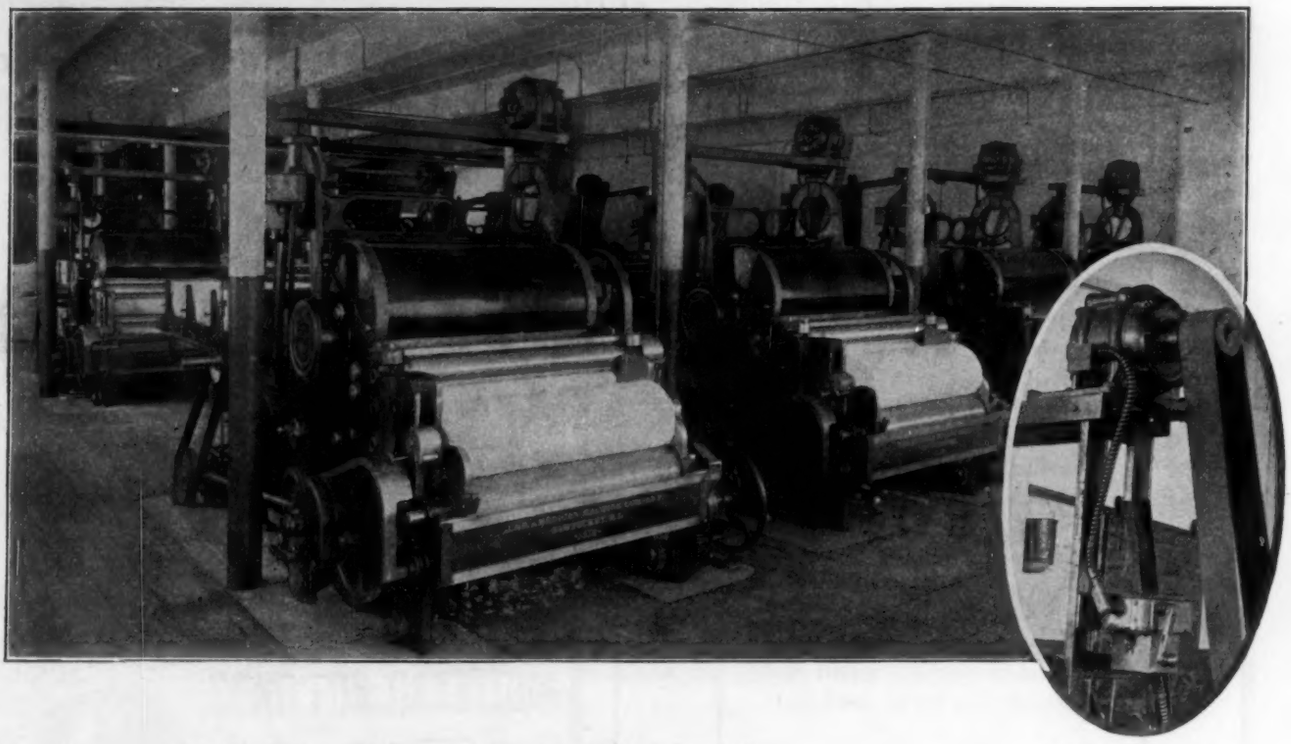

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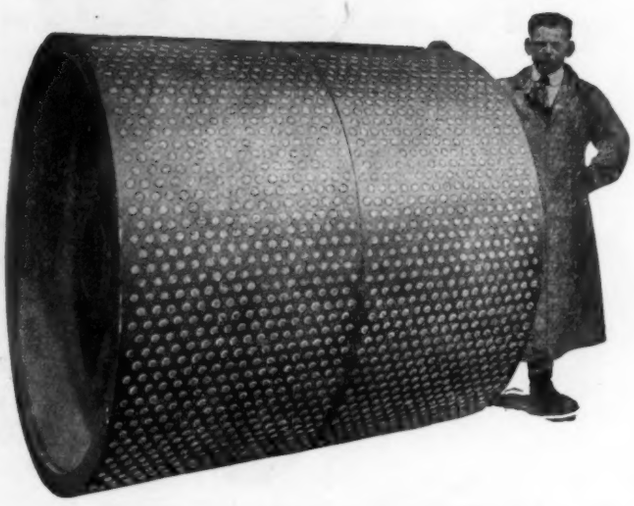

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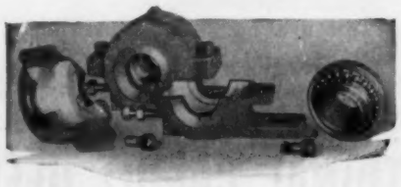

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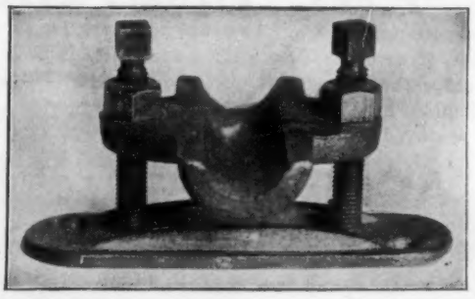

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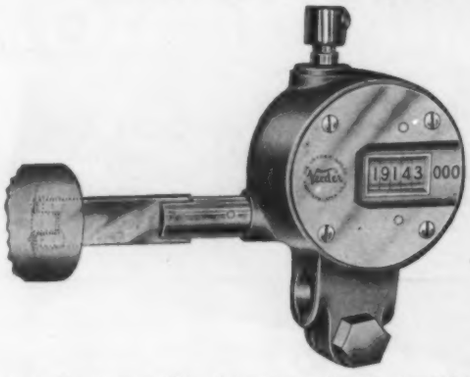

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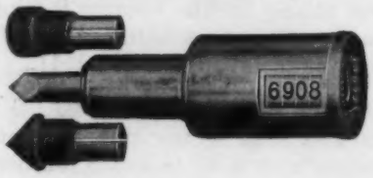

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6 Sargeant St., **HARTFORD, CONN., U. S. A.**

MAKERS OF
Cyclometers for Bicycles and Motorcycles, Odometers for Automobiles and Horse Drawn Vehicles, Tachometers, Tachodometers. and Fine Die Castings.

Hank Counters
Thread Measuring Counters

The Cheapest Fire Insurance

is insurance against fire. An ounce of prevention is worth a pound of cure any time. If a fire starts in your mill, are you prepared to stop it before it gains headway? If not, then you need two or three

ACME
FIRE EXTINGUISHERS

There's enough chemical in the Acme to extinguish a good sized fire.

Insurance companies recognize them as mighty valuable fire preventers, and any company will reduce your fire insurance rates if you install them. The Acme Extinguishers are examined, tested and labeled under the direction of the Underwriters' Laboratories, Inc.

If you do not have Acme Extinguishers in your mill, write today for our literature.

Missouri Lamp & Mfg. Company

St. Louis, - Mo.

You Are Looking for Trouble Unless You Are Protected by

NATIONAL CREDIT OFFICE REPORTS

In a Recent Failure
(name on request)

62 Creditors, non-users, lost - -	$7822.23
8 Creditors, users, lost - -	14.74
31 Users—refused even samples.	

You use our service at our expense unless we satisfy you absolutely of its value to you.

NATIONAL CREDIT OFFICE

50 Union Square, New York

Our Guarantee Makes Us Merit Patronage.

Write today for Particulars of This Unique Guaranteed Service

NATIONAL ELEVATING ROLLER BEARING CHAPMAN TRUCKS

Labor is Scarce—— Wages are High—— Why not Lessen the Labor and Lower the Cost of Trucking?

The Whole Story

Equipped With Hyatt Roller Bearings

YOU can lessen the labor and lower the cost of trucking by adopting the National-Chapman system of trucking, whereby loads are always transported on cheap wooden platforms—the truck itself being always free—always working—never delayed to wait for unloading.

The National-Chapman Elevating Truck for textiles, with platforms, costs less to install than the number of old-fashioned trucks necessary to accomplish the same amount of work. In operation, it saves from one to three men's labor—a considerable amount when figured in dollars at the end of the year.

Isn't it worth while to know all about the National-Chapman Elevating Truck for textiles—to consider it as a possible money-saver in your business? Ask for complete information and Illustrated Catalog CB.

National Scale Co.

11 Bank St., CHICOPEE FALLS, MASS.

Also Manufacturers of National Counting Machines

ROOT COUNTERS

Guesswork Is Mighty Expensive

When an order reads, 200, it does not mean 195. Neither should it require a liberal count to assure full measure. Human counters are poor machines to depend upon when every mistake means additional expense.

Precision is essential. The lack of it costs dearly. To provide it costs little. You can be sure of the right count always by equipping your machines with

Root Automatic Counters

These counters, known the world over for accuracy and never-failing reliability, are made in a variety of sizes. There is a Root Counter for any machine you may use where counts are needed.

Simplicity of construction is the chief promoter of Root satisfaction. That's why when once installed you need not think of them again except to read counts.

Write for Catalog presenting these counters and explaining their application.

C. J. ROOT COMPANY

200 Johnson Street

BRISTOL, CONN.

ROOT COUNTERS

Humidity and Temperature Regulation

DON'T shovel coal in your boilers to heat your mill and at the same time open the windows to cool it off and blow out your humidity. The outside don't need it.

CRAMER REGULATORS

were designed to effect savings of this kind; they turn the steam off the heater coils at the precise temperature desired; they turn the water off and on the humidifying system just as the conditions in the room demand.

They control your room just as the governor controls your engine.

Make the start and the saving this season.

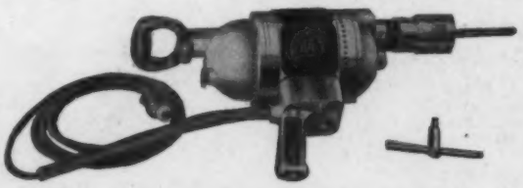
Stuart W. Cramer

New York **CHARLOTTE** **Boston**

ATTENTION!

Mill Men—Please

Do you know that the B & D Electric Drill will save many times its cost around your mill?



There is nothing handier than a portable electric drill for quick work on a break-down job and there are good reasons why the B & D drill best meets these conditions.

Write now for full particulars.

The Black & Decker Mfg. Co.

105-107-109-111-113-115 S. Calvert St., BALTIMORE, MD.

Manufacturers of Portable Electric Tools and Special Machinery of Quality.

WE saved our customer over $500.00 by welding this job. It is a giant shear used to cut large pieces of iron and steel in a scrap yard. Due to an accident the upper half broke in two pieces and four teeth were stripped from the large gear. The broken section measured 30" x 10". We welded this section and built up the four teeth in five days so that it is now as strong as new, and has been working night and day since we finished the job.

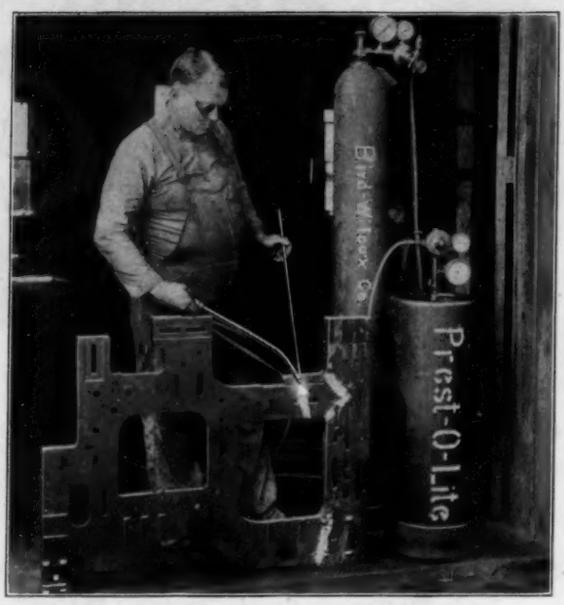
You probably have not got such a heavy piece in your mill to get broken, but if you are equipped with our Oxy-Acetylene welding apparatus you can save many times this amount each year on small parts.

Write us today—"A demonstration is a revelation."

BIRD-WILCOX CO., Inc.

Chattanooga, Tenn. **Atlanta, Ga**

Oxy-Acetylene Welding and Cutting



Valuable Loom Frame Saved by Welding

Through an accident, the loom frame shown above was broken badly in three places, and important machinery held idle until a repair or replacement could be effected. This mill had just previously installed an oxy-acetylene welding outfit, which was immediately put to work repairing the broken loom frame.

By welding it was made good as new, at a total cost of $2.25 for the repair. By this saving of time, material and replacement expense, the welding outfit practically paid for itself on this one job.

The all-round usefulness of oxy-acetylene welding is not confined to repairs like this. Your junk pile can be made to pay you a profit, by repairing and putting back into service broken or worn equipment which can be made good as new by welding, oftentimes at a trifling cost.

Prest-O-Lite PROCESS

Employs both gases (acetylene and oxygen) in portable cylinders. Prest-O-Lite Dissolved Acetylene (ready-made carbide gas) is backed by Prest-O-Lite Service, which provides dry, purified gas, insuring better welds, quicker work, and lower cost, and also avoids the large initial outlay and heavy depreciation incurred in making crude acetylene in a carbide generator.

Necessary equipment is not expensive. We furnish high-grade welding apparatus for $60 (Canada $75); acetylene service at additional cost. Adaptable for oxy-acetylene cutting by the addition of special cutting blow-pipe. Thorough instructions are furnished free to every user of Prest-O-Lite Dissolved Acetylene—any average workman who understands metals can learn the process quickly and easily.

Send for our free illustrated literature full of helpful ideas for all textile manufacterers

The Prest-O-Lite Company, Inc.

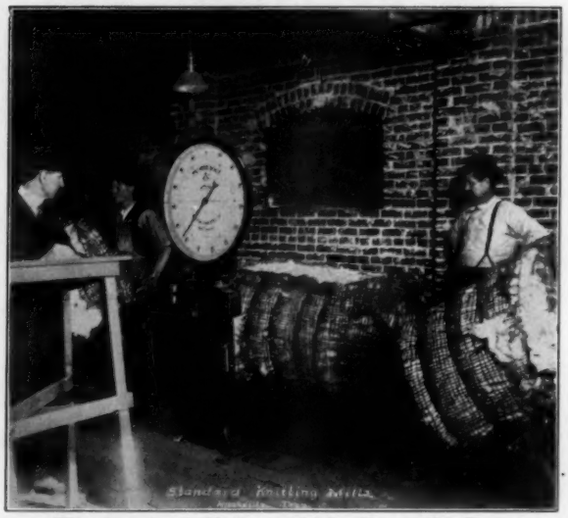
The World's Largest Makers of Dissolved Acetylene

Main Office and Factory:

836 Speedway, Indianapolis, Ind.

Canadian Office and Factory, Merritton, Ontario.

53 Branches and Charging Plants



The Standard Knitting Mills, Knoxville, Tenn.

receive all of their cotton over this Kron scale and find that it not only saves considerable time but that it reduces liability for making mistakes in reading to a minimum.

"Load and Look"

Kron Scales

AUTOMATIC SPRINGLESS

All Metal Construction

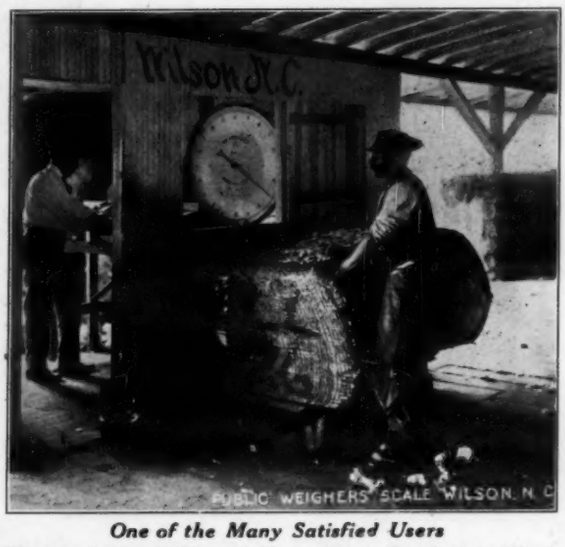
Used in hundreds of plants throughout the country where the saving of time and labor, the elimination or errors and guesswork mean a saving of money. By means of its speed and absolute accuracy, it is saving many thousands of dollars yearly to the users.

Write for catalogue and full information in regard to scales especially adapted for Textile Mills

American Kron Scale Co.

430 East 53rd Street, New York

Branch Offices: Boston, Philadelphia, Pittsburgh, Chicago, Cleveland, Louisville, Ky., Wilson, N. C.



One of the Many Satisfied Users

When the County of Wilson, N. C., purchased a Kron Scale in 1914 for their weighing, it was an experiment. Now the Public Weigher writes us that this Kron Scale has proved highly satisfactory.

Foster Valves

Stout-Hearted
Precise
Reliable

THIS FOSTER BACK PRESSURE VALVE

operates without noise or chatter—has no weights, levers or direct acting springs.

The valve proper is held to its seat by a spring operating through a compensating lever.

Provision is made to draw off the water of condensation, and when back pressure is not needed, a turn of a screw permits free passage of steam, throwing the valve out of commission for the time being.

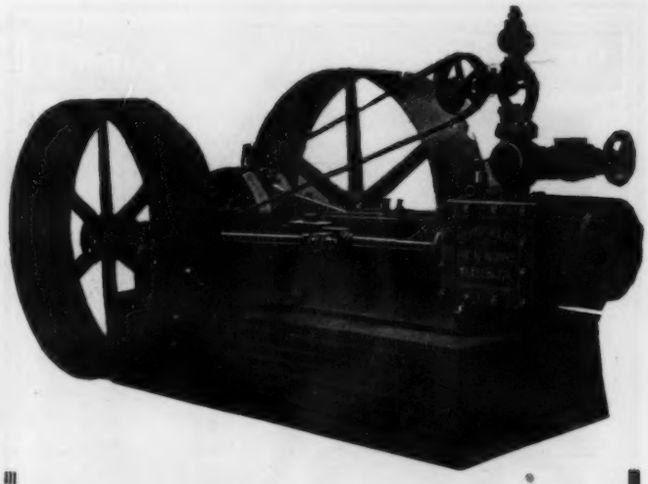
Twelve sizes from 2½ to 18 inches.

Write for catalog.

FOSTER ENGINEERING COMPANY

NEWARK, N. J.

161 Summer St., Boston, Mass. 180 No. Dearborn St., Chicago, Ill.
404 Arrott Bldg., Pittsburgh, Pa.
712 Harrison Bldg., Philadelphia, Pa.



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Macon, Georgia

MANUFACTURERS OF

High Pressure Return Tubular Boilers, High Grade Stationary Steam Engines, Tanks, Stacks, Stand Pipes.

Heavy Castings and Wrought Iron Works.

TOWERS and TANKS
That are Built Right

Boilers,

Structural Steel Work

Sheet Steel and Plate Work

Boiler Tubes, Castings, Etc.

Tell us what you want and let us quote prices.

The Walsh & Weidner Boiler Co.
Chattanooga, Tenn.

Shafts, Pulleys, Hangers, Belting, Packing, Lacing, **BOILERS** **For Mills and Public Works, Low Prices.**

Refer Chadwick, Hoskins, Woodside, Chiquola, Sibley, King, Enterprise, Langley, Piedmont and Pelzer Mills.

High Pressure Boilers built to Insurance Specifications. Rivet Holes Punched or Drilled. Pumps, Injectors, Pipe Mill Supplies, Castings.

LOMBARD **Foundry, Machine, Boiler Work, and Supply Store, AUGUSTA, GEORGIA**

PERFORATED METALS

FOR ALL PURPOSES

Such as Cotton Seed Oil Mills, Cotton Gins, Phosphate Screens, Coal Screens, Ventilation, Electrical Devices, Sugar Mills, Surfacing for Sand Rolls.

Send for Metal Sample Plate and Circular.

ERDLE PERFORATING CO.

167 YORK ST., ROCHESTER, N. Y.

AT THE ATLANTIC STEEL PLANT.

The application of the "Spraco" System to the cooling pond of the Atlantic Steel Plant of Atlanta, shown in the picture, is producing remarkable economies. The capacity of this system is 9,000 gallons per minute. The water is cooled from 114 degrees down to 82 degrees, a 32 degree drop in temperature.

The "Spraco" Cooling System increases the cooling capacity of any pond thirty-six times, has a lower cost than a cooling tower, a lower operating cost and lower depreciation, and an average of 28" vacuum the year round can be maintained if our specifications are followed and the condenser operates efficiently. The yearly saving effected by a "Spraco" System will generally pay 50 per cent return on its cost. We assume full responsibility for results if construction conforms to our plans.

Drop us a line today asking for an interesting booklet. It will explain more fully.

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New Orleans, La., A. M. Lockett & Co., Ltd., 533 Baronne St.
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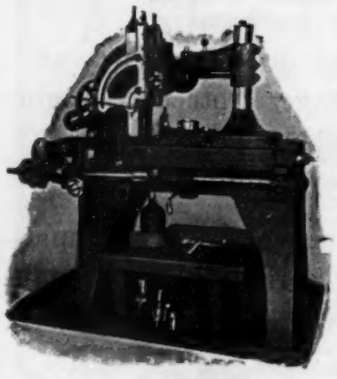
Dallas, Tex., Smith & Whitney, Southwestern Life Bldg.



Full Automatic, Semi-Automatic and Hand Operated

Gear Cutting Machines

Especially adapted for use in Cotton Mills. Hundreds now in use. Send for Special Circulars.

The D. E. Whiton Machine Co.,

NEW LONDON, CONN.

ANTI-CORROSIVE CYLINDER OIL

TRY A BARREL FOR 60 DAYS.

If it does not come up to your standard of what a good lubricating oil should be, and you consider that it is not worth our price—put your own value on it and remit on that basis. Isn't that a fair proposition? "A. C. C." will pare down your oil and cylinder repair bills—save your piston packing, too. It has been doing this for forty years, it will effect such a saving now—just give "A. A. C." a chance.

May we go into the subject with you?

ANTI-CORROSIVE CYLINDER OIL E. H. KELLOGG & CO.

E. H. KELLOGG & CO.
243 SOUTH ST. NEW YORK, N.Y.

ANTI-FRICTION LUBRICANT FLOTA MICA TRADE MARK

Mix It With Your Oil

REDUCE OIL BILLS

Flota Mica is a scientifically prepared dry compound, that is mixed with oil, the oil being used simply to carry the compound to the bearing.

Flota Mica will absolutely reduce friction, cool any hot bearing, and fill up scored marks. It will not cake or harden, nor will it stop up the finest oil groove.

A much cheaper oil can be used when Flota Mica is mixed with it, thus you can cut your oil bill in half.

Sold on the basis that if not fully satisfactory, the unused portion may be returned at our expense and no charge for the quantity used.

Write today for booklet.

THE FLOTA MICA SALES COMPANY
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AGENTS:—A. H. Carriers, Security Bldg., St. Louis, Mo.; V. A. ore, 1504 Healy Bldg., Atlanta, Ga. H. W. Nickel, 1265 Broadway, Room 411, New York City.

In the Textile Industry

—you'll find that the most progressive, wide awake mill managers are alive to the money saving possibilities of the

Morehead
Back to Boiler
SYSTEM

for the drainage of all steam heated equipment and mill heating—returning the condensation **under pressure** direct to the boilers as pure, hot feed water.

Ask us for proof of what the Morehead System is doing in the Textile Industry—your investigation places you under no obligations.

Morehead Manufacturing Company

Detroit, Cotton Mill Dept. Michigan. 386

MISSISSIPPI WIRE GLASS

Postex Cotton Mill, Post, Texas

is installed for Fire and Breakage Protection, Light Diffusion and Minimizing Cost of Maintenance.

Let us mail you samples and literature which will give valuable information.

MISSISSIPPI - WIRE - GLASS - CO. WG FIRE RETARDANT No. 32

MISSISSIPPI WIRE GLASS CO.

217 5th Ave.
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EMPIRE PAINT

That's the Best Fire Preventive Paint on The Market

so says every well informed painting contractor. The textile manufacturers are beginning to demand Empire Paint when they want to permanently protect their roofs against fire, water, weather, acid and alkali.

If you have wooden roofs on your mill buildings or village cottages, they can be absolutely protected from fire and the life of the roof indefinitely lengthened with Empire Paint.

If you have composition or metal roofs or any exposed metal structures, you can permanently protect them from rust, corrosion and acid fumes by one coat of Empire Paint.

It's not expensive because it lasts longer. Tell us the size of your roof and we'll tell you how much Empire paint will cost.

Write today for pamphlet.

The Empire Paint & Contracting Company

Incorporated

Steiner Bldg., Birmingham, Ala.

Wolf's Elastine Lacquer

A Super-Varnish

used exclusively in the

Union Central Bldg.

Cincinnati

—the largest sky-scraper west of New York.

Why? Because it is guaranteed to outwear any varnish on the market today. Will not scratch, check or break.

Send for free sample.

Leon L. Wolf Paint Co.

304 Lincoln Inn Court
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A Silent Guardian of Steel

Here is one protector that knows no sleep at night, no lay-offs through the day, is ever strong and watchful, a constant guardian of your interests, yet it asks no compensation. Once employed, it is permanent; there to stay indefinitely. Hundreds of manufacturers realize the importance of such safety assurance.

Big firms of world-wide reputation, such as the ones shown in these two pictures, use and endorse

STEWART FACTORY FENCE

because it means positive and everlasting protection for their property, combined with a neat and beautiful effect not secured by any other kind of fence.

It is thief-proof, fire-proof, riot-proof and time-proof. It is made of **heavy steel pickets**, and is absolutely non-climbable. It is the most durable, most efficient and economical fence made.

More than 30 years experience in designing and erecting fences for industrial purposes makes Stewart Factory Fence the ultimate selection of all well informed mill owners. **It is a permanent and valuable asset to any mill.**

Let us tell you why this fence is the one you should adopt; why it is the most practical in construction, and why you pay no more for its superiority. There are many sound conclusive facts about Stewart Fence which are backed by the experience of many users. To know these facts, is to take the first step toward the elimination of chance in your fence selection.

Write today for booklet.

The Stewart Iron Works Co.

525 Stewart Block, Cincinnati, O.

CLOTH CUTTING MACHINES

For Straight Edge Work, inked Samples, etc. Cut all kinds of Fabrics.

ONE STROKE OF THE LEVER OPERATES THE AUTOMATIC CLAMP AND CUTS THE GOODS, and the lever lifted, releases the material, leaving the knife guarded and ready for the next cut.

These features make our Cutters the most rapid working machines on the market.

These are the most powerful Lever Cutters made.

We also manufacture Power Cutters in all sizes.

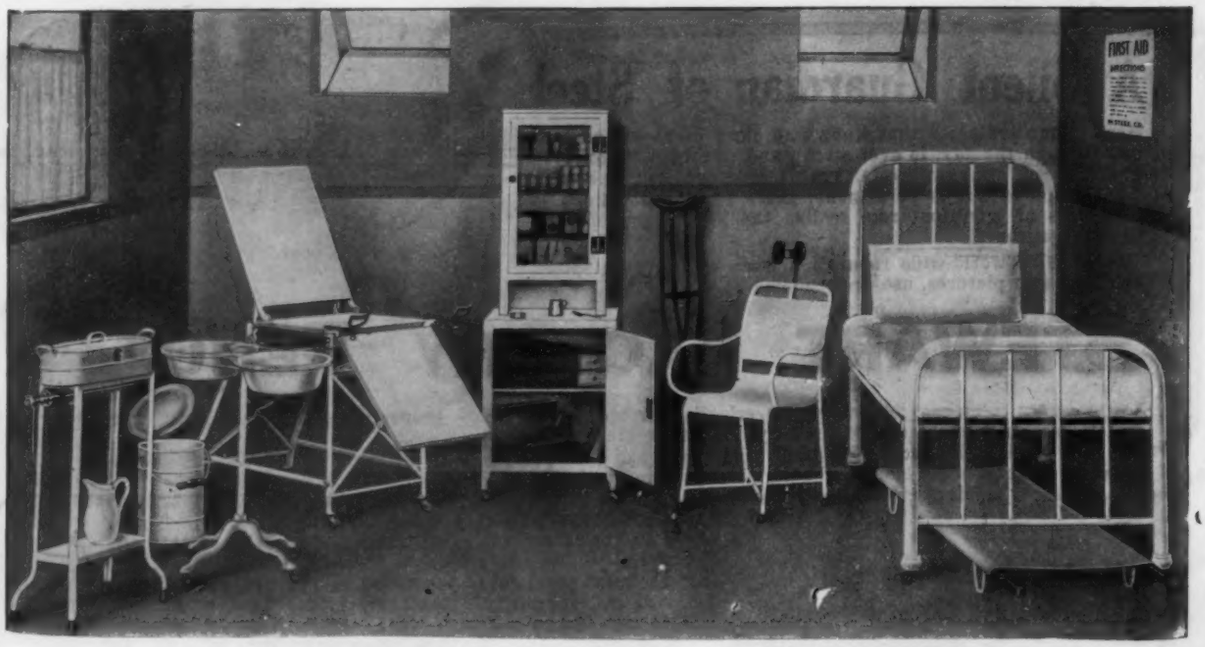
This Type made in 25-inch and 32-inch Widths.

Circulars Upon Request

This Type made in 9-inch, 14-inch and 20-inch Widths.

The Smith & Winchester Mfg. Co.,
South Windham, Conn.

H. Hinze, Sales Agent, 116 Nassau St., New York.



A NEW INDUSTRIAL FIRST AID OUTFIT.

Designed by the surgeon in charge of one of the largest Industrial plants in the country, and comes complete with everything needed for First Aid work.

Let us quote you manufacturer's prices on our New First Aid equipment or on a special outfit that better meets your requirements. Send for booklet describing First Aid or Emergency equipments.

FRANK S. BETZ CO. - - - - HAMMOND, IND.

SMITH & FURBUSH MACHINE CO.

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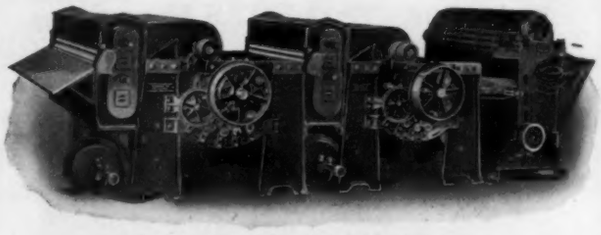


Cotton Waste Reclaiming Machine.
(Shaughnessy Patent.)

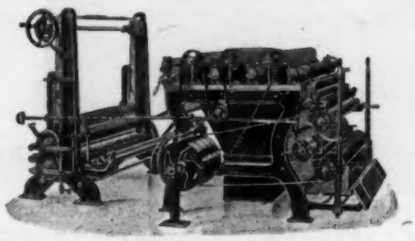
This machine does work never before accomplished and cannot be compared to any other.

It will remove dirt, shell, seeds, leaf or other foreign matter from motes, sweeps, fly, strips or damaged cotton.

Now in use by several of the best mills thoughout the country.

Send for Circular S-90.

We also build a special Willowing outfit for cotton waste—Circular S-9



COTTON BRUSHING MACHINE
With Calender Rolling Machine

Cloth Room Machinery

For all varieties of cotton fabrics

Machines for Inspecting, Trimming, Sewing, Brushing, Shearing, Singeing, Measuring, Folding, Doubling, Rolling, Winding, Trade-marking, etc., etc.

Curtis & Marble Machine Co.

WORCESTER, MASS.

Also successors to Joseph J. Schofield, of Providence, R. I.

Schofield Patent Automatic Opener and Duster.

For opening and dusting Wool, Cotton, Linters, Hair and kindred fibrous substances.

"Schofield" intermediate feeds for Cards, Wool, Rag, Waste, Hair and Lumper Pickers, Automatic, Cone and Oldham Willows, Rag and Extract Dusters, Waste Pullers, Blamaine Lap Feeds, Curled Hair Pickers, Needle Looms, etc.

WILLIAM SCHOFIELD COMPANY

Iron Founders, Textile Machinery Builders.

Krams Ave., Manayunk, Philadelphia, Pa.

ACME

BALE TIES and BUCKLES

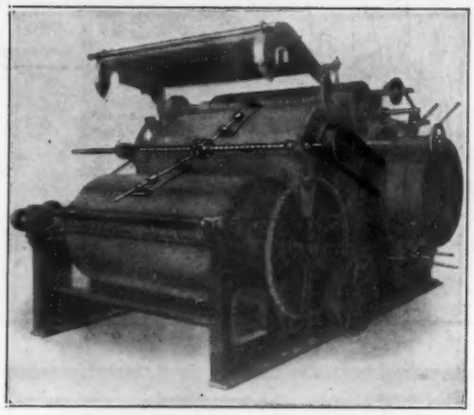
Painted Galvanized Bright No.4 Acme U Buckle.

Mfrs. of Steel Box Strapping and Steel Door Mats

ACME STEEL GOODS CO., Mfrs.

WORKS: CHICAGO, ILL. Stocks carried in New York City and Atlanta, Ga

Josephy's Patent Universal Card Grinder



Can be used on cards of various widths, that is, one Grinder will grind any card from 72" down.

Adjustable to any desirable dimension of grinding.

Suitable for fancy bearings of any construction.

Absolutely the best strickler for cotton waste cards, etc.

The fact that the demand for this well known Grinder is very large and we can under the present circumstances not import from abroad has induced us to build these machines in this country. We are therefore able to make quick deliveries at lowest prices, and repair parts, etc., can be had within 24 hours.

Write for references, prices and particulars to

The Lehnert Textile Company

184 Summer Street, Boston, Mass.

Prevent Your Waste and Broken Ends

BY USING

THE

"NO-WASTE"

Seamless Hard Fibre

ROVING CAN

It does not have the riveted seam that strains and breaks the sliver.

NO SEAMS OR RIVETS.
ABSOLUTELY SMOOTH.

ALSO

Fibre and Steel Clad Cars, Doffing Trucks and Mill Boxes of All Kinds.

SHEET FIBRE TUBES, RODS

Special Shapes.

STANDARD FIBRE CO.

25 Miller Street

SOMMERVILLE, MASS.

KEYSTONE FIBRE CO.

YORKLYN, DEL.

Peerless Seamless Roving Cans.

Keystone Gill Cans.

FIBRE RECEPTACLES

for

COTTON, WOOL, SILK AND JUTE MILLS

Write for Catalogue D.

Use SONOCO Cloth Tubes

to protect your cloth from rusty or greasy mandrels. They save many times their cost.

Southern Novelty Co., Hartsville, S.C.

"LEATHEROID" No. 2 Steel Clad Warehouse Car.

"LEATHEROID"

Cars, Doffing Trucks, Roving Cans, Barrels, Baskets are best equipment for Textile Mills.

Sold by Leading Southern Mill Supply Houses.

WRITE FOR LATEST CATALOG.

LEATHEROID SALES CO.,

1024 Filbert St., Philadelphia, Pa.

Selling Agents for The Leatheroid Mfg. Co.

Necessaries for the Mill and Shipping Department.

CARY'S EVERLASTING FLEXIBLE STEEL MAT

Has a Scraping Surface in Every Direction. Practically Indestructible.

Rust-Proof Reinforced Edges

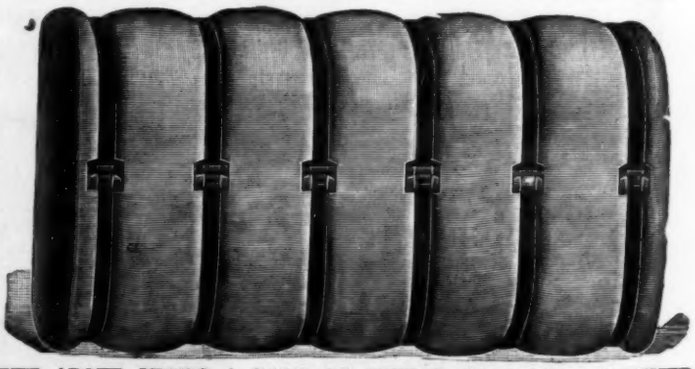
Sanitary Self-cleaning

The U. S. Government has contracted for this Mat to be used in all its buildings throughout the U. S.

TWELVE REGULAR STOCK SIZES. SPECIAL SIZES TO ORDER

CARY'S BALE BAND AND BUCKLE

THOSE WHO HAVE TRIED THEM SAY THEY ARE THE BEST



THE ABOVE SHOWS A BALE OF COTTON SECURELY FASTENED BY OUR BALE TIES AND BUCKLES NOTE ITS NEAT AND COMPACT APPEARANCE

The Buckle can be applied with the Locking or Hook part next to the Bale, so that there is no possibility of its getting caught in other Bales when piled together.

Also Manufacturers of

TWISTED AND FLAT WIRE BOX STRAPS and a FULL LINE OF SHIPPERS' SPECIALTIES.

Cary Manufacturing Company,

Manhattan Bridge Plaza BROOKLYN, N. Y.

Our new Self-Tightening Twisted Wire Strap. **Nails can be driven anywhere.**

Bradley Stencil Machine

The BRADLEY STENCIL MACHINE
Makes Stencils in half a minute, at reduced cost of 1-10c each
Write for catalogue and price list.

In universal use by thousands of manufacturers and shippers.

A. J. BRADLEY Gen. Sales Agent — 101 Beekman Street, New York, U.S.A.

Bradley Ball Stencil Pot uses Liquid Ink for marking and stenciling. Price 30c or $3.00 per doz. Manufacturers of Oil Stencil Papers.

Write for Prices and Samples.

A. J. BRADLEY MFG. CO.,

99 Beekman Street, NEW YORK

Don't **WRITE** the same wording over and over again—

Use a Rubber Stamp

Your order will be filled Promptly and Properly.

DIXIE SEAL & STAMP CO.
ATLANTA, GA.

STENCILS | **METAL CHECKS**

Hercules

TRADE-MARK REGISTERED

Warehouse Cars

Improved construction throughout. Extra heavy "Hercules" vulcanized fibre. Steel covered top moulding. Self-oiling wheels.

No. 100.

With or without hinged cover.
Catalog No. 19, describing complete line of "Hercules" receptacles, sent on request.

Fibre Specialty Mfg. Co.

Kennett Square, - Pa.

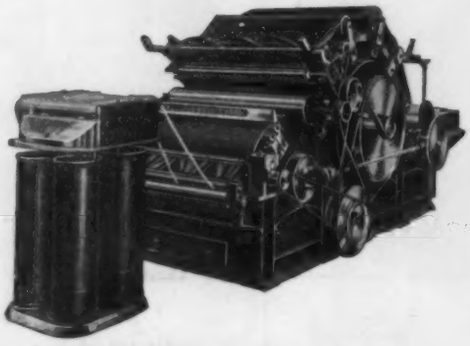
SACO-LOWELL SHOPS

TEXTILE MACHINERY

INCLUDING

SPECIAL EQUIPMENT FOR THE MANUFACTURE OF WASTE INTO YARNS & CLOTH

IMPROVED METHODS
AND
MACHINERY
FOR
HANDLING
COTTON WASTE
SIMPLE EFFICIENT



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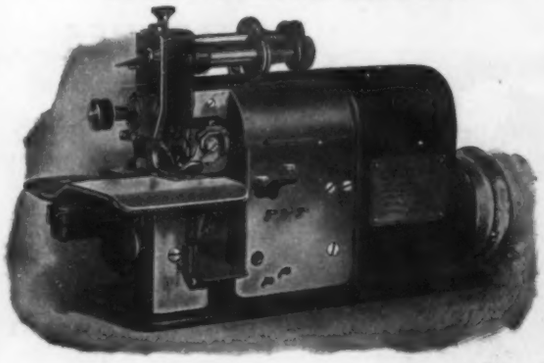

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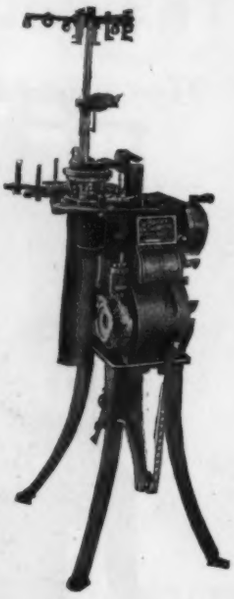

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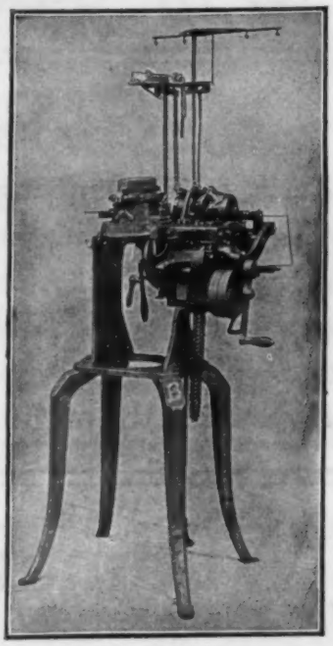

It will make the neatest, most uniform and most perfect work, and is the most profitable of any knitter on the market.

It has the simplest Automatic Splicer in the world and never causes trouble. All parts are interchangeable. Compact and strongly built. Runs easily and breaks very few needles, seldom if ever requiring repairs.

So simple that an unskilled operator can learn to run it in a day.

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other concerns, for there is not only a distinct scarcity of desirable offerings, but there is a price level booming up that makes it doubtful whether many mills will not be forced to forego the production of very fine numbers. Sea Island cotton at more than 40 cents a pound, and 1⅜-inch American fine staples at better than 34 cents, imply a condition that will surely contract the output of yarns above 80's in a very material degree. Ordinary print cloth cotton has sold already at 18½ cents a pound, while some of the better staples, used for slightly better purposes than print cloth grades, have been offered and bought at 21 cents a pound. Manufacturers are complaining that the staple is poor, and that adds to the discomfort of the cotton outlook from a mill viewpoint.

The unrest among operatives does not lessen a great deal and the Fall River unions have already made a demand upon the manufacturers for another 10 per cent advance in wages. Two advances have already been granted this year, bringing the wage lists at least 10 per cent above the highest of previous years, and it seems at this time as if a further advance cannot be avoided. In fact, some of the Western Massachusetts mills that have been pressed to hold their employees, have already granted a third advance within 15 months, and are still short of desirable workers. The situation is so complicated, in consequence of the abnormal rise in living costs, and the full employment offered at a time when cloth prices are at the highest levels known in more than a generation, that manufacturers see little possibility of doing aught else than pay, and await events of the future.

Many cloth prices have already risen to levels that will take care of an advance. If mills were sold up on the high levels they would make little of meeting the unusual demands that are presented. But the rise in prices in the past two months has been stimulated by the rise in cotton and other costs, and mills are still working on many comparatively low priced contracts. One of the most aggravating features of the labor situation is that even with the high wages already conceded, there is lacking that degree of efficiency that ought reasonably to be expected from highly paid workers. Very few mills have all the employees they require, and all are compelled, in various ways, to exceed list prices for labor to keep certain departments in operation.

Carding room operatives are especially scarce in some sections. In some cities less trouble is complained of than in either Fall River or New Bedford, and some of the northern New England mills have more employees, proportionately, than the mills in Connecticut or Middle and Western Massachusetts. The nearer the ammunition plants are the scarcer the mill operatives are.

Cloth prices have gone up so steadily that brokers have been confused and agents have had difficulty in keeping pace with them. A sale that looks good one day may seem cheap three days later. Gray goods' prices have advanced in a remarkable way, most of them now exceeding the 1907 high limit by from five to ten per cent. A sale of 38½-inch, 64x60's, print cloths, for contract delivery was made on the 19th instant at 7¾ cents a yard, or ¾ cents higher than the same mill sold at a top price in 1907. Four yard, 56x60, sheetings were quoted at 9 cents a yard, and standard drills were sold at 10½ cents. A 4-yard 80 square brought 9 cents in the first week of the month and sold for 10½ cents two weeks later in one mill. Narrow standard print cloths are quoted at 5⅜ cents.

Staple prints, which were ¼ cent a yard higher than the 1907 figure at the opening of the month, were advanced to 8½ cents, and sales of these goods, and the wider cloths in percale and shirtings patterns were shut off by agents when cotton ran above the 18-cent limit. Shirting chambray that sold in July, 1915, at 6¼ cents was placed at value having sold freely at 10 cents. Staple 8-ounce tickings opened the month at 16 cents and went to 17½ cents, and were withdrawn from sale at that figure. Staple ginghams were priced at 8 cents and went to 8½ cents, which is 1½ cents higher than the price current in 1907. Denims and other heavy colored cottons brought prices quite out of all range with any recent prices known for them in the trade. Bleached muslins went up 1 cent a yard in two weeks, and sales or 4-4 64's bleached were made at 8¾ cents for spot delivery.

All fine goods went up in the same way. On a basis of 8.50 yard 88x80's, prices for combed yarn plain fabrics went up ten per cent in two weeks, and even at these high figures mills hesitated to sell from February forward to June, because of the uncertainty of securing the high-grade long staple cotton required in making 60's warps and 90's filling yarns. Fancy weaves brought unheard of prices, but they were offered to mills in much larger quantities than they could be accepted.

Fine bed spreads, sold for the spring seasons of 1917, about four weeks ago, at 35 cents per pound, and they were withdrawn from the market for a time. When they were again offered, the new list prices were based upon a minimum of 40 cents per pound for ordinary grades of crochet goods, and a very much higher basis for the ordinary grades of satin quilts. All the quilt mills have an abundance of work in hand. Towels of a fancy character have been in wonderful demand, and are sold ahead for a long time. Diapering and other lines of specialities are so scarce that buyers will pay almost any price that will bring out the goods.

The bleacheries are fully employed, with many weeks' work ahead of them. This is also true of the finishing companies that handle piece dyes or black goods. The call for white goods of all kinds, plain and fancy, is greater than can be met, even when February deliveries are the earliest asked for. The large corporation printers have a great deal of work ahead, especially on percales, narrow prints and specialties. The job printers are not so well supplied with business. Prices for finishing are maintained at the high point, and considerable work offered on robes and draperies cannot be undertaken because of difficulties in getting fast colors.

The market reporters have ceased to talk of the yarn markets in superlatives. They apparently exhausted their vocabularies before such a thing as really high cotton came into sight. Yarn mills are complete masters of the market. They can secure $1.00 a pound for yarns they sold for 50 cents a year ago, quite as readily as they secured the lower price when the margin of profit barely offered an even chance to the spinner. The tire yarn scarcity has become so very acute that tire manufacturers and others are buying up mills and installing machinery to meet their special requirements. Fine qualities of knitting yarns for any nearby delivery are as scarce in the hands of dealers as they are in the warehouses of mills.

Opinions as to how long the phenomenal activity can go on vary from week to week. Some manufacturers are fully convinced that until the war ends there will be added calls made for products of this country's mills. This view is the one held most tenaciously by machinery manufacturers who are getting calls from many foreign countries, as well as from home customers, and cannot begin to meet them at any price suggested. Occasionally a manufacturer will say that the poor crops of the year will restrict the home trade greatly before spring, and in the same breath he states that any restriction of demand will be offset by the limited production, due to the shortage of operatives. The common purpose of manufacturers is not to fritter away profits nor to take undue risks of orders from those who cancelled in 1908. Most of the older mills are trying to stick closely by their old customers, even when they are unable to get them to readily pay some of the prices that are current. But there are others who are pursuing the policy of first come first served.

There can be no doubt of a changing attitude in this section among manufacturers who have scouted the possibilities of a sustained foreign trade after the war. Such concerns as the American and Algonquin printing companies are selling 25 per cent of their output to foreign buyers, and they have every reason to think that many of the cloths that are now getting to consumers for the first time in foreign lands will make their own way permanently. Some of the gingham mills have already established their goods firmly in foreign markets, many of them under tickets supplied to the distributor who is himself making a handsome profit and is constantly coming back with requests for more goods than can be supplied.

Some of the bleacheries are making goods for New York houses whose foreign connections are now soundly established. These fabrics are specially packaged and trade-marked, and recent results have demonstrated that it will take a long hard fight in close competition to make consumers turn again to the sleazy and clay-filled goods formerly supplied.

An Incorrect Statement.

The National Aniline & Chemical Company, 100 William Street, New York City, announce that the notice which has appeared in a number of publications to the effect that a concern incorporated as the National Dye Company of Tennessee and controlled or owned by Gaston, Wigmore & Williams, of 11 Pine Street, New York City, was a subsidiary of the National Aniline & Chemical Co., is entirely in error. President I. F. Stone of the National Aniline & Chemical Co., advises that his company has no connection whatever with the National Dye Company of Tennessee or with any of the gentlemen connected therewith. The National Aniline & Chemical Co. has no connection whatever with any other concern except their own factory, Schoellkopf Aniline & Chemical Works, Inc., of Buffalo, N. Y.

Railway Motor Gears and Pinions is the title of Bulletin No. 44419, published by the General Electric Company, Supply Department, and containing much information on the subject designated in its title. It contains 24 pages suitably illustrated and is bound in a heavy embossed cover.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, October 14th, 1916.

Although the weather has been generally favorable for harvesting the cotton crop, and ginning and receipts heavy, the fact that the last monthly crop report of the season, issued October 2nd, indicated a smaller crop than the report of the month previous indicated—11,637,000 bales exclusive of linters vs. 11,800,000 without linters—stimulated a spot demand in the South, the like of which has never been witnessed before, considering the very high level of values for this time of year. As a result the market scored a further advance during the past month of nearly two cents per pound, or $10 per bale.

Last season the southern mills, nearly all of which are located in the south Atlantic states, consumed 4,000,000 bales vs. 3,100,000 the previous season.

Indications this season are that the southern mills will consume more cotton than they used last season.

According to reliable advices Georgia and the Carolinas will not make enough cotton for home consumption this season. Last season the south Atlantic states made 3,742,000 bales exclusive of linters. This year it is said they will make less cotton than last year, while Alabama and Mississippi will make much less than one year ago.

Knowing conditions as they exist American spinners have been buying largely in the interior, and the competitive buying by Europe has resulted in the higher prices established. In the western half of the belt fairly good crops were made this year, but very poor crops were made in the eastern half of the belt.

Realizing the seriousness of the crop situation east of the Mississippi, Europe has been a constant buyer for export in the southwest, especially in Texas and Oklahoma, which markets are relatively as strong as markets in the southeast.

According to our information this year's crop by states, exclusive of linters, is about as follows: This year vs. last year—Virginia 24,000 against 16,000; North Carolina 651,000 against 699,000; South Carolina 1,065,000 against 1,134,000; Georgia 1,852,000 against 1,909,000; Forida 37,000 against 48,000; Alabama 675,000 against 1,021,000; Mississippi 756,000 against 954,000; Louisiana 386,000 against 341,000; Texas 3,863,000 against 3,227,000; Arkansas 986,000 against 816,000; Tennessee 345,000 against 303,000; Missouri 71,000 against 48,000; Oklahoma 830,000 against 640,000; California 96,000 against 36,000. Total 11,637,000 against 11,192,000.

Middling cotton in this market today is higher than the highest level reached in the Sully season of 1903-04, 16.81 vs. 16.43. While it is likely that the market will be higher later in the season, and may work higher temporarily in event of bad weather developing or if the trade demand continues, we would advise caution at present levels since only about one-quarter of the crop has been marketed so far, and as there is danger of unfavorable political developments coming to the surface when least expected.

In Europe the greatest war in the history of the world

is raging, and there has been a revival of the German submarine warfare, while in our own country the most important presidential election since the civil war is near at hand.

During the past week the South marketed 574,000 bales, last year 484,000, since August 1st 3,170,000 against 2,501,000.

Spinners of the world took of American cotton the past week 314,000 bales, last year 324,000, since August 1st, 2,263,000, last year 2,310,000.

The world's visible supply of American cotton is now only 437,000 bales smaller than one year ago, whereas on August 1st was 1,153,000 bales smaller than last year.

According to today's Census report American mills consumed, including linters, 591,000 bales during September, last year 566,000, for first two months of the season 1,222,000, last year 1,091,000. Manufacturers' stocks in U. S. Sept. 30th, 1,328,000, last year 1,090,000.

Under the caption, "Cotton and the Cotton Market." Theodore H. Price in *Commerce and Finance* for October 18th, says:

"Looking ahead we are still unable to see why cotton should be selling at the highest prices commercially established since 1874.

"Abnormally high prices presuppose scarcity, but it is exceedingly difficult to argue scarcity from the figures of demand and supply thus far available.

"Even if the government estimate is not exceeded we shall have:

An American crop of (linters included)		12,600,000
The visible supply of American July 31st was		2,235,264
The U. S. mill stocks July 31 (as per census) were		1,632,456
The European mill stocks (as per Ellison) were		700,000
Total supply		17,167,720
The American consumption, excluding foreign cotton but including linters, estimated on the basis of the census figures for August and September can not exceed	7,000,000	
The British consumption may be	4,000,000	
Continental Europe and Japan may take	3,000,000	14,000,000
Leaving a supply, visible and invisible, July 31st, 1917		3,167,720

These figures represent the extreme views of the most bullish bulls. They make no allowance for a crop in excess of the government estimate or the probable effect of high prices in reducing consumption. Certainly they do not suggest famine, especially when considered in connection with the probability of an enormous increase in the American cotton acreage next season. Most of this acreage will have been planted within the next five or six months, long before the present crop has been marketed. The expectation of lower prices will lead spinners to reduce their stocks and it is not impossible that we may come to July 31, 1917, with a visible supply nearly as large as at the commencement of this season.

"A recognition of this was dawning upon the market last week when the submarine raid off Nantucket gave it a shock that made prompt resuscitation necessary in order to avoid complete collapse. While the methods adopted have been temporarily successful they are suggestive of the pulmotor and the artificial respiration induced still seems to be labored and unnatural. The burnt child dreads the fire, and even if it were possible to construct a logical theory of higher prices upon a basis more concrete than that furnished by the word "inflation," it is doubtful whether a speculation that has once been scared can be induced to re-enter the cotton market at 17½ cents a pound. The maximum profit promised even by the most enthusiastic bulls is 2½ cents a pound. The loss might be five cents or more if Germany should succeed in stopping our commerce with the Allies, or some unforeseen development drew the United States into the war."

Lancashire Notes.

BY AN ENGLISH CORRESPONDENT.

The phenomenally high price of cotton gives great interest to a document issued by F. M. Walker and Co., of Liverpool, which deals with freights as a factor in the cost. The commandeering of cotton ships for war purposes, and the limitation of the amount of space which may be devoted to cotton in others, has had the effect of sending up freights to a very high level, and it is Messrs. Walker's opinion that they may rise still higher. At present, cotton ships may use only half their carrying capacity for cotton and the Liverpool firm thinks that this may be reduced to 33 or even 25 per cent. Faced with such a situation, this firm tell how they approached the Board of Trade with a view to getting the Board to take action which would reduce the shipping charge to a more reasonable level.

It was pointed out to the Board of Trade at what a disadvantage Lancashire stood in relation to her competitors, America and Japan. America, of course, has her cotton on the spot, and in the interests of the Japanese cotton industry three Government-subsidised shipping lines are run. Before the war, British freights to Liverpool were about 30 cents per 100 as compared with Japan's average of forty cents; whereas, today, the Japanese rate has only advanced to 75 cents against a British rate of $1.25. At different times since the commencement of the war, the rate has been even higher than $1.25, and at one time was as high as $3.00, Japan also has the advantage of a lower rate of insurance against war risks, the Japanese Government charging a rate of about one-eighth per cent as compared with from one to three per cent charged by the British Government. In this matter of insurance, as well as of high freights, the firm named sought the assistance of the Board of Trade. Their efforts, however, met with no success. The Board replied that high freights and difficulties of transport were due to the shortage of shipping and that it saw "no sufficient reason for taking any special action to deal with the specific case of cotton, in view of the fact that any special action which would improve the position so far as this article is concerned would be at the expense of other necessary imports."

The question of the high price of cotton in its wider aspect has been the subject of an interesting article in "The Manchester Guardian," by Professor J. A. Todd, of Nottingham. His view is that the only hope of averting serious inconvenience arising from a short crop is that high prices will check demand, and even that is "a broken reed." Answering his own question as to whether anything can be done to meet the situation, he replies, "Frankly, nothing at all, except, perhaps if the situation becomes very acute to start a cotton saving campaign as a war economy. Waste of cotton at ninepence a pound ought to be a serious offense.

and cotton is, to some extent, like mustard; a considerable part of the total consumption is, if not wasted, at least not used to its last ounce of utility." Professor Todd pointed out that the Egyptian crop is not likely to be of any assistance in the present crisis, as the early promises of a record acreage and an 8,000,000 cantar crop have been sadly falsified. The area is about 6 per cent below the record of 1914, and it is Mr. Todd's opinion that the crop will not exceed 6,500,000 cantars.

It is the view of Professor Todd that "it is doubtful whether the maximum world's crops are now sufficient to meet the possible demand of the world for cotton goods." Lancashire, he argues, must make up its mind that, this time, the question of the raw cotton supply shall be fought out to a finish. It must take the long view. "The work of the British Cotton-Growing Association has shown that there are enormous areas in our own Empire which can, beyond the shadow of a doubt, produce large quantities of good cotton if only the necessary capital were available for their development by the opening up of railways, the provision of irrigation facilities, etc. In Egypt and the Sudan there is, comparatively speaking, no limit to the amount of fine cotton which could be produced in the course of time. East and West Africa, particularly, could give us large quantities of good cotton in the course of time. But it is to India that we must look for any prospect of early assistance. There, too, it will take time, but not nearly so long as anywhere else. What the Professor thinks is necessary, is an organization of the size of a State Department with all the Governments of the British Empire behind it, and he believes that if the British Empire were developed even as far as the southern states of America are today we would not be dependent on the latter for cotton.

Everybody is pleased that the protest of the trade has been successful and that the cotton industry is not to be included in the extension of the Insurance Act which came into operation on September 4th. The purpose of the extension was to bring into unemployment insurance all employes engaged on "munition work." The term "munition work" included the making of textile goods which were to be used for the Army or Navy, the object of the act being to make some provision for the unemployment which it is expected will follow the war. In the case of the cotton industry there were practical difficulties in the way which were immediately apparent to anyone acquainted with the trade; and employers and operatives united in pointing these out to the Government with a view to obtaining exclusion from the new measure. The employers did not wish to be burdened with a further tax and the operatives wanted no more deductions from wages. The workers are already insured under the health insurance scheme, in connection with which the employers estimate that they have paid $175,000,000 since the law came into operation in 1912, and the addition of insurance against unemployment would have meant that the employers would have had to pay 2½ pence per week for every operative employed, the employee paying a like sum. However, the protest of the trade was not unavailing and it will not be included in the scheme.

The dispute in the hardwaste trade, which was pending when I wrote last month, has been settled. The weavers asked for a 10 per cent advance in wages and the employers offered an immediate advance of 5 per cent with a further advance of 2½ per cent in December. This offer was accepted by the operatives. The concession means that, in December, weavers' wages in the hardwaste trade will be 12½ per cent higher than they were before the war. I hear on good authority that the other weavers throughout the trade will shortly put forward a claim for a 10 per cent advance.

The Cotton Situation in Austria.

Paper in the place of cotton has proved of extraordinary value in solving one of Austria-Hungary's greatest economic problems, according to Arthur Kuffler, president of the War Association of Cotton Spinners, which is the government organization controlling cotton consumption, and also president of the Austrian Cotton Spinners' Association. Herr Kuffler explained in a recent interview with a newspaper correspondent how Austria-Hungary has met the situation caused by the cutting off of American cotton through the British blockade.

"The Central Powers could use more than a million bales of cotton right now," he is reported as saying, "but we are able to get along without it, ifwe must. We are getting 5,000 to 10,000 bales a month from Turkey. Before the outbreak of the war this amount was much greater, but it has shown a decrease recently, owing to the deportation of Armenians, who are the principal cotton planters in Asia Minor."

A vast assortment of fabrics made from paper which, he explained, was taking the place of cotton, were exhibited. The articles ranged from flour bags holding 200 pounds to twine. Other textiles were manufactured from a mixture of paper yarn as warp and cotton or wool as filling. They range from coarse white goods to a fairly fine cloth. These paper fabrics, after being woven, are treated chemically to make them impervious to water, and more durable and pliable.

"There is no telling," he said, "what paper cloth may lead to yet. When we first started, the products were indifferent, but since then they have constantly bettered. I believe that the innovation will affect cotton growers for all time, because it is unlikely that we will return to using cotton for purposes where paper cloth is better suited, owing to its cheapness. To this extent cotton growers all over the world will be damaged.

"The war has taught us not only to look for cotton substitutes, but to economize, and the result is that it is unlikely that we will return to our former consumption of American cotton for several years after the war. There are also other factors responsible for this, among them being exchange questions. Formerly the American cotton seller drew actual cash for a bill of lading through a London bank on a three and six-months sight draft. The European cotton buyer paid three to six months later, the London banks carrying the financial end meanwhile. After the war it is improbable that we will return to this system, for various reasons, one being that the London banks may be unable to resume that class of business.

"This means that the New York banks must give the cotton buyer three to six months' credit. The cotton business must, therefore, be placed on a totally new basis. In other words, while the European cotton buyer in the past carried the Southern cotton grower, the latter must

in future, for a long time, anyway, carry the cotton buyers. In addition we intend to support the Turkish cotton industry in Asia Minor and Mesopotamia. The possibilities in that region for cotton growing will be unlimited with the building of new railroads and the provision for irrigation. Cotton from Asia Minor is of poor quality, but may be improved yet.

"I doubt that we will do much stocking up in cotton at the end of the war, because the exchange rate is against us to the extent of forbidding this. We own consderable cotton now, stored in the United States, either by direct purchase or futures, and we would naturally import that, but new sales are likely to be slight, if peace enables us to get cotton from anywhere, the British colonies included."

Herr Kuffler said that the Austrian cotton industry was in a healthy condition. Although many of the mills had closed down, all debts have been paid, owing to the tremendous increase in the prices of cotton goods. The pay of cotton workers had gone up, he said, and the industries' personal losses through the war were very immaterial, as most of the employees were women, and there were no more than about 9,000 cotton workers at the front. Speaking of the industrial situation in general, Kuffler said that in some instances wages had increased 400 per cent., and that there was little chance that the country would ever return to the low wages in effect before the war.

"Much as I would like to see the end of the war," he concluded, "I fear the cotton situation will not influence it, despite Sir William Ramsey's view that the cotton embargo would keep cotton for explosives from the Central Powers. We are now using wood fibre with good results, because explosives of the cellulose type can be made from any cellulose matter, and this is plentiful in the vegetable world."

The Yarn Market.

The cotton yarn market still continues to be a spinners' market. Despite the high prices for raw cotton, the yarn mills continue to sell their entire products and at sufficiently advanced prices to cover all increases in raw material. Early in the month new business was slow in the Philadelphia market, but many southern spinners were reported to be filled up despite the fact that they had advanced the price to 38½c for combed single yarns on the basis of 10's. A sale of about 50,000 pounds of Eastern 24's to 28's on cones was sold for 47½c for the 24's and 48½c for the 28's, delivery to start in April. Southern frame spun 16's and 18's were sold on the basis of 36½c for 10's, delivery to be made in October and November. Ply combed yarns were advancing, but not so fast as the singles. Prices of carded yarn on cones had also advanced and a sale of 150,000 lbs. of high grade southern carded cones was made on the basis of 31c for 10's, delivery to start in October. There was a light demand for weaving yarns and buying was practically limited to small quantities for quick delivery.

A little later in the month it was reported that the bulk of the demand for weaving yarns was coming from the East. There was very little demand in the Philadelphia market from local users. Both Northern and Southern spinners of carded yarns on cones were reported to be sold up and prices quoted varied widely. Southern carded yarns on cones in 24's ran all the way from 34c to 37c.

As the month closes nothing is in sight that indicates lower prices for this year. There was some discussion as to the effect of the U-boat raid off the New England coast on the probable yarn prices, inasmuch as the importation from England would be cut off, but it did not seem likely that the market needed any stimulus of this character, as after every sale the prices go up. Holders of 2-ply combed yarns are getting their own price. One holder of 60's 2-ply, for which there is a good demand, would not sell for less than 90c. However, 90c is cheap when compared with the 94 cents and upward that the spinners are quoting. Comment at this time is useless, inasmuch as those who are in a position to furnish the yarn have no difficulty in securing the price.

Following are recent quotations on the Philadelphia market:

Southern Single Skeins.

8s	27 @27½	10s	28 @28½
12s	29 @29½	14s	30 @30½
16s	30½ @31	20s	32 @32½
24s	34 @34½	26s	35 @35½
30s	38 @38½		

Southern Single Warps.

8s	27½@28	10s	28½@29
12s	29 @29½	14s	30 @30½
16s	30½@31	20s	33 @34
26s	35 @35½	30s	38 @39
40s	50 @51		

Carpet and Upholstery Yarns in Skeins.

8-4 slack	29½@30	9-4 slack	30 @30½
8-3-4 hard twist	27 @27½		

Southern Two-Ply Skeins.

8s	28 @28½	10s	28½@29
12s	29 @29½	14s	30
16s	29½@30	20s	33½@34
24s	35½@36	26s	36 @36½
30s	38½@39	40s	52 @53
50s	64 @66	60s	74 @75

Southern Two-Ply Warps.

8s	28½	10s	28½@29
12s	29 @29½	14s	30½@31
16s	31 @31½	20s	34 @34½
24s	36 @36½	30s	38½@39
40s	52 @54	50s	64 @66

Northern Two-Ply Carded Peeler Skeins.

20s	35½@36	24s	37½@38
26s	38 @38½	30s	40 @42
36s	46 @48	40s	54 @56
50s	65 @68		

Two-Ply Combed Peeler Skeins.

20s	48 @49	24s	52 @53
30s	56 @57	40s	67 @68
50s	79 @81	60s	90 @92
70s	1.00 @1.15		

Southern Frame Spun Yarn on Cones.

8s	30 @30½	10s	30½@31
12s	31 @31½	14s	31½@32
16s	32 @32½	18s	32½@33
20s	33 @33½	22s	34 @34½
24s	35 @35½	26s	35½@36
30s	38 @39	40s	49 @50

Northern Mule Spun Carded Yarn on Cones.

10s	33½@34	12s	34 @34½
14s	34½@35	16s	35 @35½
18s	35½@36	20s	36 @36½
24s	36½@37	26s	37 @38
30s	40 @42		

Northern Mule Spun Combed Peeler Yarn on Cones.

10s	31½@42	12s	42 @42½
14s	42½@43	16s	43 @43½
18s	43½@44	20s	44 @44½
22s	44½@45	26s	45½@46
30s	52 @54	36s	57 @58
40s	60 @61		

Announcement.

The Lehnert Textile Machinery Company, Boston, Mass., has been incorporated with capital stock of $10,000. The directors are Herman H. Lehnert, president; George Blaney, treasurer; Wm. J. E. Sander and B. F. DeCosta.

The company is operating a machine shop in Roxbury, Mass., where they are building a variety of machinery for woolen, cotton waste mills, etc.

Graddick's Production Table No. 4

(Copyright, 1914, by F. C. Graddick.)

Production table for warp yarn spinning, showing the pounds per day per spindle that can be produced on spinning machinery in Nos. and tenths of average Nos. from 4's to 31's at 10 hours per day. Allowance has been made for all necessary stoppage such as doffing, oiling, banding, cleaning, etc.

Yarn No.	Square Root No.	Twist per Inch	Front Roll Speed	Spindle Speed	Lbs. per day Per spindle	Lbs. per day Per spindle No. & 10th	Lbs. per day Per spindle No. & 20th	Lbs. per day Per spindle No. & 30th	Lbs. per day Per spindle No. & 40th	Lbs. per day Per spindle No. & 50th	Lbs. per day Per spindle No. & 60th	Lbs. per day Per spindle No. & 70th	Lbs. per day Per spindle No. & 80th	Lbs. per day Per spindle No. & 90th
4	2.00	9.50	166	4950	2.27	2.22	2.17	2.12	2.07	2.03	1.98	1.93	1.88	1.83
5	2.23	10.62	163	5450	1.79	1.75	1.72	1.69	1.66	1.63	1.59	1.56	1.53	1.50
6	2.44	11.63	161	5900	1.47	1.44	1.42	1.40	1.38	1.36	1.33	1.31	1.29	1.27
7	2.64	12.56	159	6300	1.25	1.23	1.21	1.19	1.18	1.16	1.14	1.13	1.11	1.09
8	2.82	13.43	157	6650	1.08	1.06	1.05	1.04	1.02	1.01	1.00	.991	.979	.966
9	3.00	14.25	155	7000	.954	.943	.933	.923	.913	.903	.893	.883	.873	.863
10	3.16	15.02	153	7250	.853	.844	.835	.826	.817	.809	.800	.791	.782	.773
11	3.31	15.75	151	7500	.765	.757	.750	.743	.736	.729	.722	.715	.708	.701
12	3.46	16.45	149	7750	.694	.687	.681	.675	.668	.662	.656	.649	.643	.637
13	3.60	17.12	147	7950	.631	.625	.620	.615	.610	.605	.599	.594	.589	.584
14	3.74	17.77	145	8150	.579	.574	.569	.564	.560	.555	.550	.546	.541	.536
15	3.87	18.59	143	8300	.532	.528	.525	.521	.518	.514	.511	.507	.504	.500
16	4.00	19.00	141	8450	.497	.494	.491	.488	.485	.482	.479	.476	.473	.470
17	4.12	19.58	139	8600	.468	.464	.460	.456	.452	.448	.444	.440	.436	.432
18	4.24	20.15	138	8750	.429	.425	.422	.419	.416	.413	.410	.407	.404	.401
19	4.35	20.70	136	8850	.398	.395	.393	.391	.389	.387	.384	.382	.380	.378
20	4.47	21.24	134	8950	.376	.373	.371	.369	.367	.365	.362	.360	.358	.356
21	4.85	21.76	132	9050	.354	.351	.349	.347	.345	.343	.340	.338	.336	.334
22	4.69	22.27	130	9100	.332	.330	.328	.326	.324	.322	.320	.318	.316	.314
23	4.79	22.78	128	9150	.312	.310	.308	.306	.304	.303	.301	.299	.297	.295
24	4.89	23.27	126	9200	.294	.292	.291	.289	.288	.287	.285	.284	.282	.281
25	5.00	23.75	124	9300	.280	.278	.277	.276	.275	.274	.272	.271	.270	.269
26	5.09	24.22	123	9400	.268	.266	.265	.264	.263	.262	.260	.259	.258	.257
27	5.19	24.68	121	9400	.256	.254	.253	.252	.250	.249	.248	.246	.245	.244
28	5.29	25.13	120	9500	.243	.241	.240	.239	.238	.237	.235	.234	.233	.232
29	5.38	25.58	118	9500	.231	.229	.228	.227	.226	.225	.224	.223	.222	.221
30	5.47	26.02	116	9500	.220	.219	.218	.217	.216	.215	.214	.213	.212	.211
31	5.56	26.49	114	9500	.210	.209	.208	.207	.206	.205	.204	.203	.202	.201

To find production of any average No. read to the intersection of the No. nearest to the 10th, 20th, 30th, 40th, 50th, 60th, 70th, 80th, or 90th.

COTTON MANUFACTURING.

Designs for Fancy Cotton Fabrics.

BY T. WOODHOUSE AND J. IRELAND.

PART THIRTY-THREE.

The cloth illustrated in Fig. 146 has an embossed-like effect; the texture is very close, and the fabric is suitable for upholstery. The warp threads are of two different kinds in the same colors, and arranged as follows: 1 thread 2

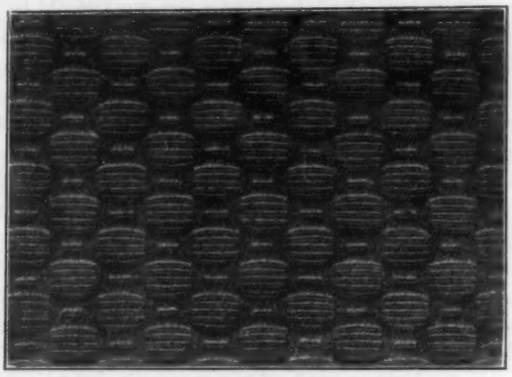


FIG. 146.

ply olive green mercerized cotton for figure; 1 thread 2 ply olive green cotton for binding; 1 thread 2 ply olive green mercerized cotton for figure.

The mercerized cotton figuring threads weave in pairs, while the binding threads are in reality cutting threads in the corded section. There are 76 figuring threads and 38 binding threads per inch, or altogether 114 threads per inch of warp, and 82 filling picks of 2 ply olive green cotton per inch.

One complete unit of the design appears at N, Fig. 147, on 60 threads and 30 picks; the figuring threads are shown in crosses, and the ground or binding threads are shown in dots. In order to obtain the corded or repp effect as shown in low relief and so pronounced in the pattern, Fig. 146, it is absolutely essential that the threads of the warp should be very closely set as indicated above, or, in other words, that there should be far more threads per inch than in those fabrics where the weft forms part of the ornamentation.

In Fig. 146, the weft is perfectly hidden, and all the effect is therefore developed by the warp threads. Thus, the raised rectangular parts are obtained by floating 30 of the threads over several picks, e. g., the first 5 threads and the last 5 threads in the central figure, at N. Fig. 147, float over 17 picks, while the remaining 10 threads float over 8 picks, under 1 pick, and over 8 picks. The dropping of these 10 threads in the middle of the 17 picks is responsible for the small rectangular hollow in the center of this larger rectangle. The binding threads are raised over the weft two or three times in these 17 picks as is clearly indicated by the dots at N. Fig. 147.

The large number of threads per inch in the warp and the difference in the interlacing power of the threads in the corded and rectangular parts respectively, accounts for the convex sides in the former and the concave sides in the latter in the way of the filling. The remaining two sides of each figure are perfectly straight. On reference to the design it will be seen that the last two picks of one rectangle form the first two picks of the next rectangle, although in the actual cloth, Fig. 146, these edges appear as two concave sides in different horizontal planes. The central pick in each rectangular and corded area is perfectly horizontal, but on either side of the central pick, the curved effect appears, and this deflection from a straight course is greater still on the

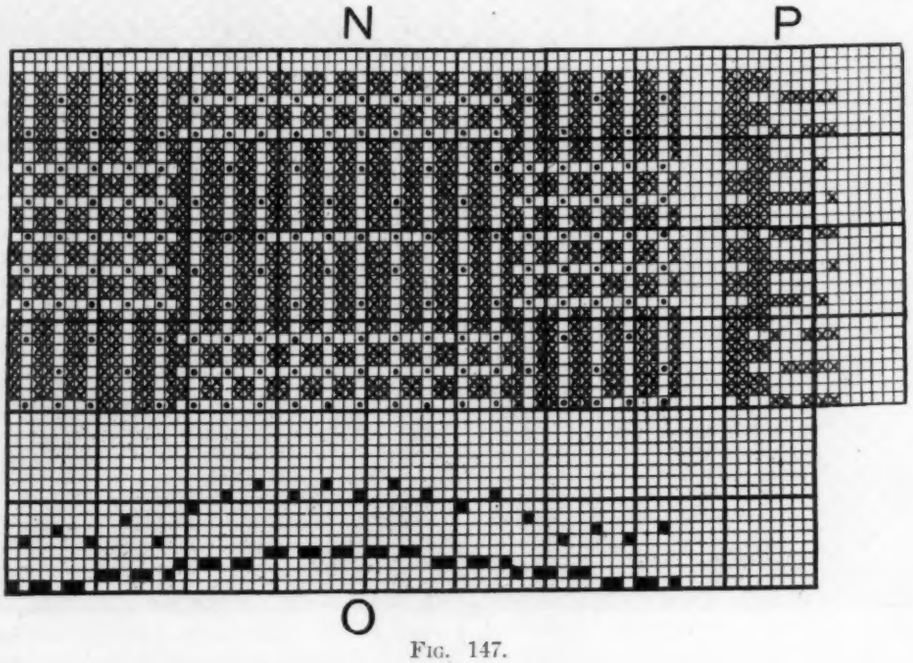


FIG. 147.

succeeding picks where the adjoining edges of two areas form a distinct sinuous effect. The design N. Fig. 147, can

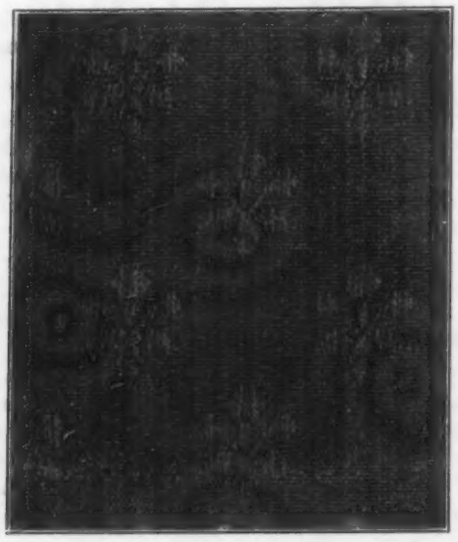


FIG. 148.

be drafted on to 10 harnesses as shown by the draft at O, while the weaving plan on 10 by 30 appears at P.

An example of spot figuring without the aid of special threads is shown by the pattern in Fig. 148. Two shades of green warp are used arranged, as follows:

Dark Green	4	1	1		= 6	
Light Green		2	1	2	= 5	11 threads

or symmetrically

Dark Green	2	1	1	2	= 6	
Light Green	2	1	2		= 5	11 threads

This order on 11 threads is repeated for the desired number of times according to the width of the fabric. There are 66 threads per inch, and 47 picks per inch of light green filling. One unit of the pattern appears at Q, Fig. 149, arranged with one complete floral spot pattern in the center, and the remaining floral spot pattern at the four corners. The construction of these spots, which are identical in form, will be easily followed from the unbroken one in the center.

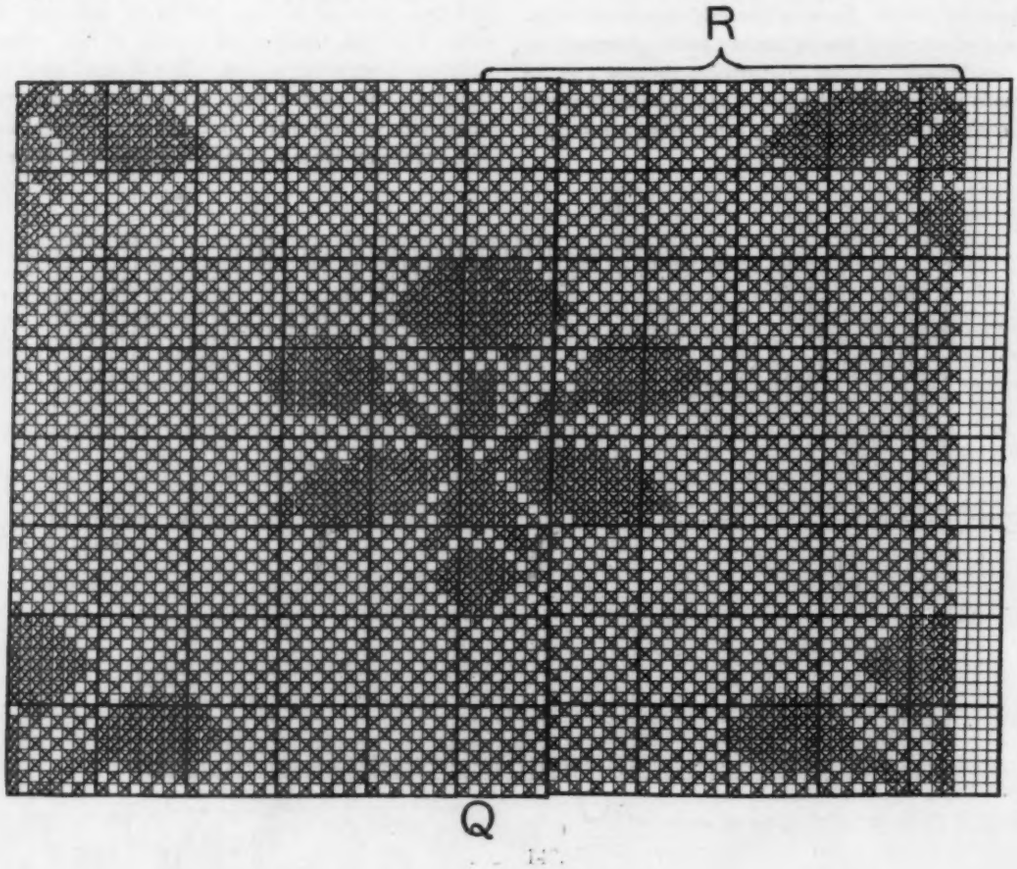
The design is perfectly symmetrical, and with a center or pointed draft, could be woven with 43 harnesses, when the weaving plan would be the 43 threads marked R. The cloth could be woven with 42 harnesses if the 3 plain threads at each edge of the figure were drawn on two harnesses. Such a departure from a simple pointed draft is not advisable; as a matter of fact, it is highly probable that harnesses would not be used at all, but that a jacquard would be used.

The capacity of the jacquard would be determined by what was considered to be a reasonable number of cords or threads per hook, and since the set of the fabric is fixed, the number of repeats of the pattern would naturally be determined by the width of the cloth. Let us suppose, for example, that the cloth in the finished state was 24 inches wide, then: 24 inches $\times$ 66 per inch = 1584 threads in the width, and 1584 threads $\div$ 84 threads per repeat = 18 threads + 72 threads.

If we assume that in one horizintal row of patterns in the cloth the pattern starts and finishes with a complete flower, we should have 18½ repeats + 30 threads. Thus:

84 threads $\times$ 18½ repeats =	1554
selvages =	30
	1584

The following table will give an idea as to the best ma-



chine to employ for the weaving of the cloth according to the facilities available in the factory:

Jacquard Machine neglecting the odd row	Total No. of hooks in use	Number of hooks idle	Number of harness cords attached to each hook.
100's	84	16	42 with 18 & 42 with 19
200's	168	32	126 with 9 & 42 with 10
300's	252	48	210 with 6 & 42 with 7
400's	336	64	126 with 4 & 210 with 5

The above mentioned extra row or add row in the card could be used for the selvages of the fabric.

(To be continued.)

Identifying Cotton Yarns by Colors.

BY G. D. CRAIN, JR.

In a cotton spinning mill where a wide variety of yarns is produced, one of the features which requires constant attention is preventing material in process of manufacture from being mixed. Mistakes of this kind are sometimes made, even by competent and experienced workers, haste, poor light or some other unfavorable circumstance resulting in the error. It is therefore a problem to devise a system which will render automatic the selection of the right material, and reduce the amount of effort and time required to handle the yarn from one set of machines to the next. Any scheme which will reduce the difficulties experienced in this way should be worthy of general adoption.

A large mill in the Ohio Valley has been experimenting with success in the use of colors for the purpose of making identification easy. The system involves the use of a different color or combination of colors for each number of yarn, the development of combinations being necessary on account of the unusually wide range of the numbers manufactured in this plant. By this same token, this condition emphasized the importance of a system of handling the material which would eliminate the numerous opportunities for error.

The plan adopted consists of painting the ends of the bobbins, with the result that if a mistake were to be made in selecting the wrong bobbin, this would be immediately brought to the attention of the operative or the overseer as soon as it was put on the machine. It would be a "flag," calling attention at once to the error which had been made. In fact, by the use of this signal system, it is believed, it would be practically impossible to mix two different numbers of yarn.

The plan used in preparing the bobbins for use is interesting, as well as simple. At one end of the room a small pulley was attached to a table, and a cord slipped over the shafting overhead. This turned the pulley at high speed, and the bobbins were slipped over a rod attached to the pulley, and painted while in motion, this resulting in an even distribution of the paint, and its application in a fraction of the time which would be required otherwise. Quick-drying paint was used, and the work of marking the bobbins and spools, which would be a tremendous job otherwise, was thus completed in a comparatively short time. The work was done gradually, as opportunity offered, no particular difficulty being experienced.

The color plan was applied to the speeder bobbins, spinning bobbins, twister bobbins, warper spools and twister spools. The bobbins were painted at only one end, the spools being painted on the head, so that in placing them on the spooler, it would be easy to get the yarn in the right position without having to examine the spool. This is another evidence of the practicability of the idea, inasmuch as it tends to eliminate another kind of error, besides saving the time usually involved in examining the spools before placing them on the spooler.

It was found advisable, owing to the character of the operation, to paint the heads of the twister spools with a cross, instead of a circle or ring, as in the other cases, as it proved to be a more effective eye-catcher than the other. Bands were shown, painted at right angles, and if there was any variation here, it was immediately signaled by means of the strong contrast. Another advantage was that in the event a spool stopped, the contrast between the idle spool and the remainder of those on the twister was great enough to get attention, whereas a uniform surface would not show much of a difference between its appearance still and in motion. The importance of getting a prompt signal of an idle spool in three-ply and similar work is obvious, so that the introduction of the color plan tended to save a lot of defective work in this part of the mill.

The color idea proved so effective in this department that it has now been applied to other sections. This mill buys only two or three standard grades of cotton, but for its special purposes these grades are divided and subdivided. It would be difficult to devise a system of descriptives which would immediately indicate what mill grade was wanted or was being used, and while numbers would have served, the use of numbers would have lacked the graphic quality which pertains to the use of colors. So the plan was adopted of identifying each of the numerous grades by colors, the number of colors available being sufficient to enable this to be done, with the exception that one or two had to be still further subdivided by such markings as Blue Number One, Blue Number Two, etc.

The result of the use of this plan is that when the superintendent steps into the office of the overseer, he glances at the wall and sees just what kind of cotton is going through, the cards hanging up on hooks representing each machine indicating without the necessity of a second look just what the situation is. The cards carry the additional data needed, such as the name and number of the machine, the number of the yarn and the grade of the cotton—this being indicated on the card by color, rather than otherwise—the use of the color plan merely serving to simplify the matter of determining the grades which are actually being employed at a given time.

The plan has been useful not only in the mill proper, but in preparing the cotton for manufacture. When it is being distributed to the various bins after being opened up, each bin carries a sign naming the "color" or grade of cotton which is being delivered to it. Thus, if the superintendent sees that "Yellow" cotton is going into a certain bin, he knows without actually examining it, that a grade just below good middling is being furnished.

It is worth while to follow the cotton by colors from the beginning, so even the laps are marked in this way, colored chalk being used for this purpose.

There is one other way in which the color system has been applied, and that is to call attention to the difference

between combed and carded yarn. On the spinning frame is to be found a pink pad and a yellow one. The pink is used to identify carded material, and the yellow for the combed. When the yarn is doffed off the spinning-frame, a slip of the required color is placed with it, so that there is no danger of the two varieties being mistaken for each other.

The experienced millman may assume that this is an unnecessary precaution, and while it is true that under ordinary conditions there would be no excuse for making a mistake, it is also true that on a dark day, when the opportunity for making a close inspection was lacking, an error might be made. In fact, such mistakes are not by any means unheard of, and the simple plan of identifying the yarn by means of the colored slip makes it next to impossible to confuse carded and combed yarn.

The color plan seems to have a good many advantages, though a practical difficulty at present is the lack of coloring materials. In fact, the system as outlined has not been actually carried out in all departments, the shortage and high price of paints, especially of certain colors, having made it impracticable to complete the work. But enough has been done to emphasize the value of the idea, and in the course of a short time it will be universally in operation in this plant.

One other point which might be mentioned in this connection is that often the bobbins and spools are delivered by the manufacturer already painted a certain color. This is a disadvantage to the user, if the color scheme is being used, for the color must usually be changed. It would be better to specify that the bobbins merely be shellaced at the factory, thus enabling the color desired by the mill to be applied after they were delivered.

"Anything which tends to eliminate error in a spinning-mill is in my opinion a good idea," said the superintendent of the mill whose methods have been described, "and I know that the use of identifying colors on the bobbins and spools will certainly go far in this direction. In some mills, making comparatively few numbers, it might not be worth while to go to the trouble and expense of painting the bobbins, but our line is so varied that it takes a good deal of effort to keep everything going just right, and the color plan has simplified my work in this direction considerably. I believe that it could be adapted to a good many other classes of textile manufacturing."

Food For Serious Thought.

Food for serious thought is contained in the following from The Manufacturers Record, Baltimore, Maryland, of August 10th, under the caption, "Labor Shortage Should be Met by Labor-saving Machinery."

Wherever possible machinery should be made to supplant manual labor if we are to meet competition with Europe.

So great is the scarcity of labor throughout the country that Eastern interests, including railroads, are striving in every way possible to tempt labor away from the South. Western iron interests are taking men from the Birmingham district. Eastern railroads, according to Savannah reports, have recently taken more than a thousand negroes from that section on special trains, while efforts are being made to get other thousands away. The struggle for labor is the fight of the hour in this country, and, as immigration will probably be small for some years to come, the contest for labor will grow in intensity.

Only through the largest utilization of labor-saving machinery of every kind will it be possible for manufacturers to meet this labor shortage without serious loss.

While Europe is bending every energy toward the highest possible efficiency in death-dealing devices, it should be our effort to bend every possible energy to the highest development of labor-saving improvements in order that manual labor, wherever feasible, be supplanted or aided by mechanical labor. In doing this the laborer is benefited and the industries of the country saved from a situation which seriously threatens their continued expansion and prosperity.

The manufacturers of the country should not wait until the labor shortage has become so acute as to endanger their business, but should begin now to work out plans for labor-saving devices wherever this can be done to advantage. The engineers and the machinery dealers of the country should turn their attention to a study of new ways of lessening the amount of manual labor and of creating new forms of machinery or new adaptations of equipment or inventions to take the place of manual labor.

At the close of the war Europe will be stimulated by its necessities as never before to produce at the lowest cost. Its industries will have developed an efficiency never dreamed of before, and back of all of this will be the spirit to conquer the world trade against us, stimulated not only by their necessities, but by our threats to take the trade from them.

The people of this country do not seem to have measured this situation properly from any standpoint, either that of industrial preparedness or of national preparedness."

The United States Department of Labor in its immigration bulletin for July 1916 gives the following figures as the number of immigrants to this country for the ten years each ending June 30 as follows:

1905	1,026,499
1906	1,100,735
1907	1,285,349
1908	782,870
1909	751,786
1910	1,041,570
1911	878,587
1912	838,172
1913	1,197,892
1914	1,218,480
Total for the ten years	10,121,940
Average per annum	1,012,194

The corresponding figures for the years 1915 and 1916 are:

1915	326,700
1916	298,826

From these last figures deductions must be made for emigrants departed.

1915	204,074
1916	129,765
Net average immigrants per annum for 1915 and 1916	145,844

These statistics emphasize the importance to manufacturers of the use of automatic machinery, and especially to those cotton mills equipped with plain looms.

Dyeing, Bleaching and Finishing.

Stripping of Rags and Shoddy.

BY A. F. MUSGRAVE.

It is the aim of every mill superintendent when using colored shoddy, to use as dark colored shoddy as possible. The chief reason for this is the lower price at which such dark rags sell when compared to those of light color. It is, of course, a simple matter to use a dark colored stock in goods which are to be dyed black, or a darker color than the rags originally were, but more difficult when the goods are to be colored a lighter shade, or about the same shade as the stock. Thus in order to secure good results with dark stock it is necessary to use some method of destroying all or a good part of their color or at least to equalize the various shades of rags so that the resultant goods will not look mixy.

Stripping of colored rags previous to reworking is also sometimes resorted to even where the goods are to be dyed a black. Such a case came to the attention of the writer some few years ago where a mill desired to produce a black cloth with silk effects and to use a fair amount of dark colored wool clips. Several samples were made up and colored with an afterchrome black which left silk white, but the pieces came out with the silk stained. The first thing the mill did was to try another piece with a different black but the results were the same. The trouble was finally remedied by giving the rags a slight stripping, thus removing the loose color which bled into the silk either during the fulling or dyeing.

There are several methods which are used for the stripping of wool or union rags but all come under the two great processes of oxidation or reduction. Of the oxidation processes the well known chrome and sulphuric acid method is the best. Discharging with hydrosulphite is an exactly opposite process in that the color is reduced. A treatment with soda does not come under either of these heads, but the stripping action is so small that it really cannot be called by that name.

The chrome and sulphuric acid method which is carried out by boiling the rags for about an hour in a bath containing from 3 to 6 per cent sulphuric acid and from 2½ to 5 per cent of chrome thus depends for its success on the strong oxidizing action of chromic acid. This method is also valued on account of the chrome oxide which is deposited on the fiber during the stripping. The rags are thus lightened in color and mordanted at the same time. Such a mordant as this is of course not suitable for the true alizarine colors and owing to the rapidity of deposition of the mordant is also more or less apt to produce dyeings which crock. It must also be considered, however, that the only shades which give trouble by crocking are the very dark ones and it would seldom be necessary to discharge the rags in order to dye them such a deep color. A defect of this process is that it does not produce neutral grounds, most colored rags being turned to a yellowish brown when boiled in chrome and sulphuric acid. Some times this is a big advantage and I recall one instance when dyeing carpet stock for low grade theatrical wigs that the stripping with chrome and sulphuric acid produced the correct yellow brown of blond hair.

The hydrosulphite preparations which have been mentioned several times in this journal are also well suited for the discharging of shoddy and have the advantage over the oxidation method of producing a lighter ground. The cost is no doubt a little greater than when stripping with chrome and sulphuric acid but this slight difference in cost is more than offset by the advantage of having a light ground. It will also be found that a saving in steam will result from the hydrosulphite method owing to the shorter boil required. A strong discharge with hydrosulphite will affect the feel of the stock to a greater degree than the chrome sulphuric acid method.

Of the hydrosulphite compounds the one best suited for discharging color from wool stock is the zinc compound which must be used in conjunction with acid. This particular hydrosulphite preparation is sold under the name Hydrosulphite AZ, Hydraldite Z, etc. It is, of course, more economical to prepare the hydrosulphite in the dyehouse just before it is to be used. This is accomplished by the action of zinc dust on sodium bisulphite solution. In order to prepare a hydrosulphite solution take one pail (which is equivalent to about 30 lbs.) of bisulphite of soda, 72 degrees Tw, and dilute with one half pail of water. Three pounds of zinc dust is then taken and slowly added, with constant stirring. The zinc dust if added quickly will cause an intense heat which spoils the product. The mixture is then allowed to stand for a few minutes and then tested by the sense of smell. Bisulphite of soda has a very sharp penetrating odor and it can readily be detected if it has not all been reduced. The hydrosulphite prepared in this manner is not stable and should be used within an hour of being made.

For a strong stripping it will take from 1-2 to one pail of this mixture to one hundreds pounds of stock. It is best to add the hydrosulphite to the bath when it is about half way to the boiling point; where an open tub is used it is of course necessary to throw the stock in after the bath has been prepared. The bath is then brought to the boil and boiled until the goods are sufficiently lightened, in no case should it be necessary to boil longer than one half hour. The bath is then run off and the goods given a cold and a warm rinse. The slight soapy feel which is sometimes noted on rags which have been stripped in this manner will disappear on boiling in an acid dyebath.

When using Hydrosulphite AZ it is only necessary to sprinkle into the cold bath from 3 to 7 per cent of the powder and from 2 to 5 per cent acetic acid and to add the stock. The bath is then brought slowly to the boil when another three per cent of acetic acid may be added. Formic and sulphuric acid are also used to decompose the hydrosulphite, but have the disadvantage of acting too quickly. The rinsing with cold and warm water should be followed in this case also.

The hydrosulphites which act in a neutral bath may also be used for discharging wool but it is a well known fact that wool always retains its lofty feel better in an acid bath.

The methods herein given are also applicable to union rags or pieces as well as to silk but the latter fiber is principally worked over into black and seldom requires a stripping.

Liquid Bleach on Wool.

BY JOSEPH H. BARKER.*

It is generally admitted that the liquid process does not yield quite the same dense opaque whiteness as that which results from the stoving process; but it has been found to possess some compensating advantages; not the least of which is the greater permanence of color, and, when the cloth is dry, the absence of the odor peculiar to sulphur. The odor is slightly perceptible when the cloth or flannel is moist and warm, but is not so pronounced as to be objectionable. The liquid process has also the further advantage of being both economical and convenient.

Sodium bisulphite is the usual bleaching agent by this method; and the following course of procedure will be found to be safe, convenient, and effectual, and is based on many years of experience and practice.

BLEACHING WITH BISULPHITE.

In a wooden tank fitted with a wince a solution of sodium bisulphite is made in quantity sufficient for the quantity of cloth to be bleached, and the degree of bleaching to be done. A solution consisting of from 10 to 20 per cent of sodium bisulphite and from 80 to 90 per cent of water will be found suitable for ordinary purposes. That proportion may be varied to suit the character and color of the material to be bleached. Observation and experience, and regard for the effect to be produced, should serve to guide an expert bleacher in determining both the strength of the solution and the quantity required in each case.

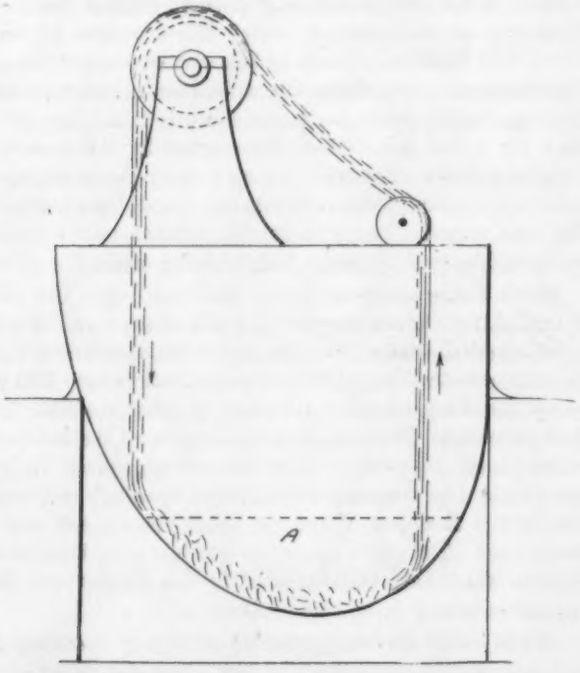


FIG. 1. BLEACHIG MACHINE FOR BISULPHITE.

If an equal quantity, say 10 to 20 per cent., of hydrochloric acid be added to the solution, the bleaching solution becomes much more effective. It is held that a still better method is to treat the wool with sodium bisulphite and hydrochloric acid in separate baths, whereby the sulphurous acid is generated within the fibre, and, being in the nascent state, acts more effectually upon the coloring matter in the wool.

The bleaching is sometimes performed in the ordinary cloth washing machines, but there are obvious objections to this, particularly if the machines are also used for washing dyed goods, in which case there is grave risk of the colors being affected by the deposits of sulphur which may lurk in parts of the machine.

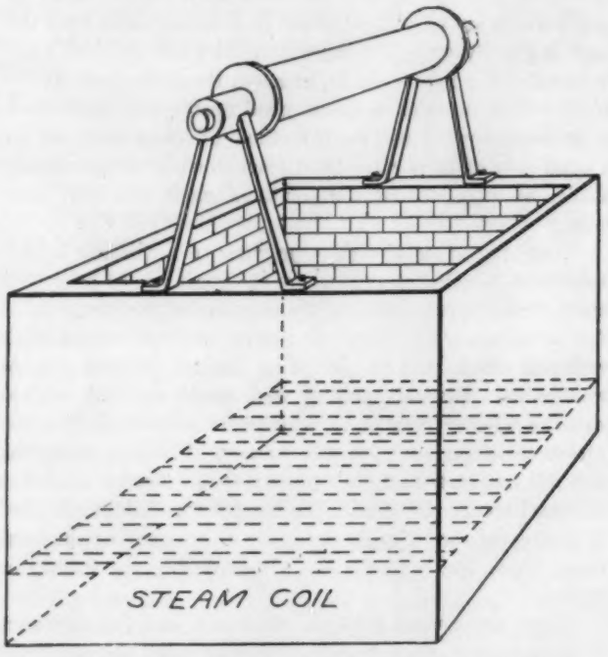


FIG. 2. BLEACHING MACHINE FOR PEROXIDE.

It is much to be preferred that machines specially constructed and reserved for bleaching should be used. Fig. 1 represents such a machine, which, it will be observed, is very simple in construction. It consists of a tank or cistern so shaped as to facilitate the free circulation of the cloth under process of bleaching, in the lower part of the tank, and at a convenient height above the tank a wince is mounted, which is actuated by a belt in the usual manner. There is also a friction roller and guide boards placed farther back for the purpose of guiding the cloth and keeping it in its proper position in the machine, exactly the same as in an ordinary washing machine. The cloth is arranged in the machine in the manner usual in washing machines, the ends being sewn together as usual so as to form an endless web.

The bleaching solution is then added in quantity sufficient thoroughly to saturate the cloth, and keep it immersed in the bottom of the machine, as indicated at A.

The machine may then be run slowly for one or two hours, or more if necessary, until the cloth is thoroughly and evenly saturated, and the chemical action of the bleaching solution has had ample time to take effect. The cloth is then washed in clean tepid water in the ordinary washing machine, and dried in the usual manner.

Not the least of the advantages is that the sodium bi-

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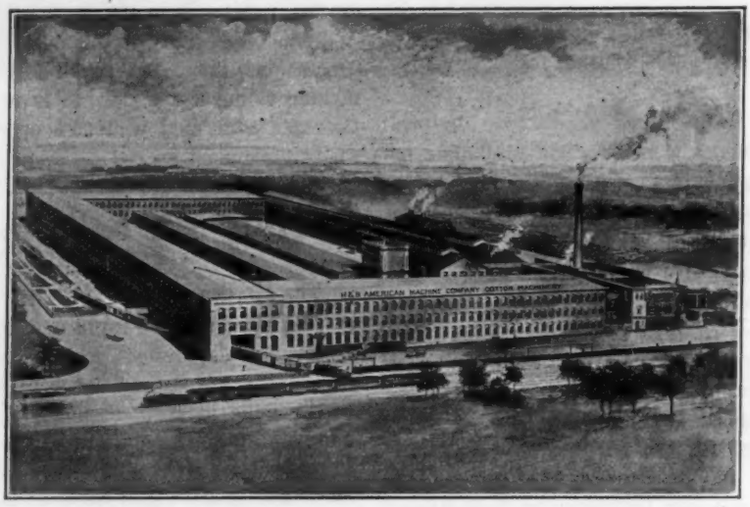

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PAWTUCKET, R. I.

sulphite—which crystallizes in drying—acts, not only upon the surface of the cloth, but penetrates to its core, and permeates every part; and to that circumstance, and to the action of the hydrochloric acid, is doubtless due the greater permanency of liquid bleaching.

DRAWBACKS OF THE PROCESS.

Nevertheless, some of the objectionable features, inseparable from sulphur bleaching, may be observed, but in a mitigated form; there is still the liability to spot or stain if the cloth comes into contact with iron in any form; the slightly objectionable smell of sulphur when the cloth is moist and warm; and the more or less fugitiveness of the color; for it must be admitted that after frequent washings the cloth gradually assumes somewhat of its natural and original color, although not to the same extent as after stoving.

Before the cloth is bleached by either process, it is absolutely necessary that it be scoured perfectly clean, and made free from all dirt and grease—natural or acquired; and when it is placed in the bleaching machine it should be in a moist condition—not wet, and not dry. The degree of moisture most suitable is that which remains after being hydro-extracted. If the cloth is too wet, it will scarcely "take" the bleaching liquor at all; and if it is too dry, it will absorb the liquor irregularly, and the cloth will present a patchy or cloudy appearance.

Too much emphasis cannot be laid upon the necessity of protecting the cloth from contact with iron in any form. Such parts of the machines as are made of iron, should be protected and cased in wood, and all the other ironwork should be limewashed. Painting with oil paint has been found by experience to be ineffectual in preserving the iron work from the corroding action of sulphur.

Not less emphasis must be laid upon the necessity of avoiding the use of chalybeate water in connection with all goods which have to be, or have been bleached. Water impregnated with iron is absolutely unfit for use.

PEROXIDE OF HYDROGEN.

There can be no doubt that the most perfect and successful bleaching agent is peroxide of hydrogen. Wool which is quite yellow in color may be bleached by this agent to a white of a brilliancy and purity which is quite unattainable by the other processes and agents. Over-dyed wool may be stripped and restored to almost its original whiteness. The nascent oxygen oxidizes and discharges all the natural coloring matter which exists within the horny shell of the wool fibre.

It has been objected that after being bleached by hydrogen peroxide the appearance of the wool or cloth is less one of whiteness than of transparency, an appearance due, doubtless in some measure, to the semi-transparent horny character of the wool fibre. The general appearance, nevertheless, is one of pure whiteness, with the advantage that the whiteness is permanent; the coloring matter having been discharged, never to return.

Not the least of the advantages of bleaching by this bleaching agent is that the wool or cloth, as the case may be, may be dyed in any color, not excepting those which are most brilliant or delicate.

Possibly the cost of bleaching with hydrogen peroxide may, in some cases, be an objection; but that possible difficulty has been removed in recent years by the production of a commercial hydrogen peroxide for extensive use at a

moderate price. It may now be obtained in the form of a solution, the standard of which is indicated in "volumes," ten vols. being the ordinary commercial standard for bleaching purposes. This may be reduced according to varying requirements, and for ordinary purposes a solution of one vol. strength has been found by experience to be quite efficient under ordinary circumstances; that is to say, one part by measure of hydrogen peroxide to nine parts of water; and 100 lb. weight of woolen cloth would require, approximately, 100 gallons of this solution for satisfactory bleaching.

The solution would, with litmus paper, give an acid reaction, but for use should be made slightly alkaline by the addition of liquid ammonia.

The routine of the process is simple, but requires to be conducted with judgment and care; and the necessary plant is of a simple and inexpensive character.

A suitable plant consists of a wooden cistern, preferably lined with glazed tiles or bricks, 6 feet in length by 3 feet 6 inches in width, and 3 feet 6 inches in depth, upon which is mounted a wince as shown in Fig. 2. The cistern is fitted with perforated or latticed false bottom, beneath which steam coils are arranged for the purpose of maintaining the bleaching solution at an equable temperature; the temperature most suitable for bleaching by this method being 100 deg. F.

The steam coils are of lead, and no iron should anywhere be used in the construction of the cistern.

The bath having been prepared, the cloth is placed in it by passing it, at its full extension of width, over the wince, and winding it slowly into the solution, giving time for it to become thoroughly and evenly saturated as it settles into the bleaching solution. The cloth should be evenly moist, not wet or quite dry when placed in the solution, and it should be allowed to remain immersed from ten to twelve hours, according to the degree of bleaching which may be necessary.

The strength and efficiency of the bath is all the better maintained if a wooden cover (made entirely of wood—no screws or nails being used in its construction) be used, which should fit closely but at the same time freely within the cistern, to the end that it may be free to float upon the surface of the solution, and thus, as far as may be possible, protect the solution from contact with the surrounding atmosphere, which would otherwise absorb oxygen from the solution, and so reduce its efficacy.

When the time arrives for the removal of the cloth from the cistern, the cloth should be wound upon the wince, and the solution contained in the saturated cloth be allowed to drain into the cistern, the reason of which will be obvious: the partially exhausted solution may then be strengthened by the addition of fresh hydrogen peroxide, and be used again and again, until it is desirable to prepare an entirely new bath.

The bleaching being completed, the cloth is washed with soap and water—tepid water by preference, if a soft handle is required, as in the case of flannels and some other similar goods—and then dried in the open air, if that be possible; and the bleaching may then be regarded as complete. The condition of the cloth would then be absolutely neutral, and not more liable to spot than other unbleached cloths. After bleaching by hydrogen peroxide the cloth is absolutely odorless, and there is no liability towards a return of the original and natural color; for the reason that the coloring matter has been discharged, never to return.

The solution must not be allowed to come in contact with either iron or copper, and chalybeate water, it need hardly be said, must be rigidly avoided; and if a bright and pure atmosphere be available, a few hours' exposure in the open air will add much to the efficacy of chemical bleaching.

Some bleachers after bleaching by the hydrogen peroxide process pass the cloth through a bath of sodium bi-sulphate, making it more opaque. It is to be remarked, however, that this additional whiteness or opaqueness is not necessarily permanent.

The M. O. H. Co., Enlarges Boston Office.

The Marden, Orth & Hastings Company, Inc., announce that by reason of the rapid development of the business in their textile department, which handles industrial oils, chemicals and dyestuffs, and much of which is necessarily with textile mills in New England, that they have decided to handle all inquiries and orders for this territory, insofar as is possible, from the Boston office of the company at 225 Purchase Street. It is believed that this will be of considerable advantage to New England mills in the way of more prompt service. The textile department of the Boston office will be in charge of Shepherd M. Crain, Jr., who will be assisted by a competent staff of salesmen. A complete stock of their standard materials will be carried on hand in their Boston warehouse for immediate delivery. In the future all inquiries, requests for prices and samples, etc., from the New England territory, should be addressed to the Boston office at 225 Purchase Street.

Lectures on Fire Prevention.

Several mills in North Carolina have arranged with Leon L. Wolf of the Leon L. Wolf Paint Co., inventor of Wolf's anti-flame and Wolf's fire retarding paints, to give a series of lectures on fire prevention, fire protection, fire drills and rescue work to the employees of their mills. Mr. Wolf took a course of instruction at the New York and Philadelphia Fire Schools and has quite a collection of interesting pictures of tests made at the Underwriters Laboratories at Chicago, which he will use to illustrate his lectures as Mr. Wolf will be down in North and South Carolina for several weeks and has several open dates, any mill owners who are interested and would like to have his employees receive the benefit of this lecture can do so by writing him care of the Leon L. Wolf Paint Co., Cincinnati, Ohio.

A SIMPLE METHOD OF WATERPROOFING.—A method of waterproofing soldiers' uniforms recommended by the Paris Academy of Sciences is impregnation with a small amount of wool-fat. Of the fat, 5 to 10 parts are liquefied in a little chloroform, and the solution is diluted with 90 to 95 parts of petrol. A uniform, braid and all, may be stirred in this liquid, then wrung out and dried in the air without injury to its appearance. For bags and leggings, another French wet-resisting treatment consists in brushing in a mixture of tale with 50 per cent of vaseline.

Barrett Specification Roofs Guaranteed for 20 Years

OUR new plan to guarantee Barrett Specification Roofs for 20 years seems to have met with instant welcome from architects, owners and roofing contractors.

During the first few weeks the plan was in operation *several million feet* of Barrett Specification Guaranteed Roofs were specified.

This means that the owners of these roofs are guaranteed against all roof repair and upkeep expense until 1936.

The new Guaranty Bond is issued on all Barrett Specification Roofs of 50 squares or more in all towns in the United States and Canada of 25,000 population and over—*and in smaller centers where our Inspection Service is available.*

Our only requirements are that the roofing contractors be approved by us and that The Barrett Specification dated May 1, 1916, shall be strictly followed.

The Guaranty is arranged for as follows:

The owner or his architect orders the roofing contractor to "construct a Barrett Specification Roof and get for him a Barrett 20 Year Guaranty Bond on the work."

The contractor notifies us that he wishes the 20 Year Bond and will construct the roof under the supervision of a Barrett Inspector.

The Barrett Inspector on completion of the job certifies that the proper quantity of Specification Pitch and Felt has been used and that The Barrett Specification of May 1, 1916, has been strictly followed.

On our O. K. of the job, the U. S. Fidelity & Guaranty Company issues a regular 20 Year Guaranty Bond, by which the owner is relieved of all costs for repairs or maintenance to the roof during the next 20 years.

The Guarantee Bond costs the owner and roofing contractor nothing. The service is free in the interest of good workmanship and the good repute of our materials.

If you are interested in the proposition we shall be glad to send you further details.

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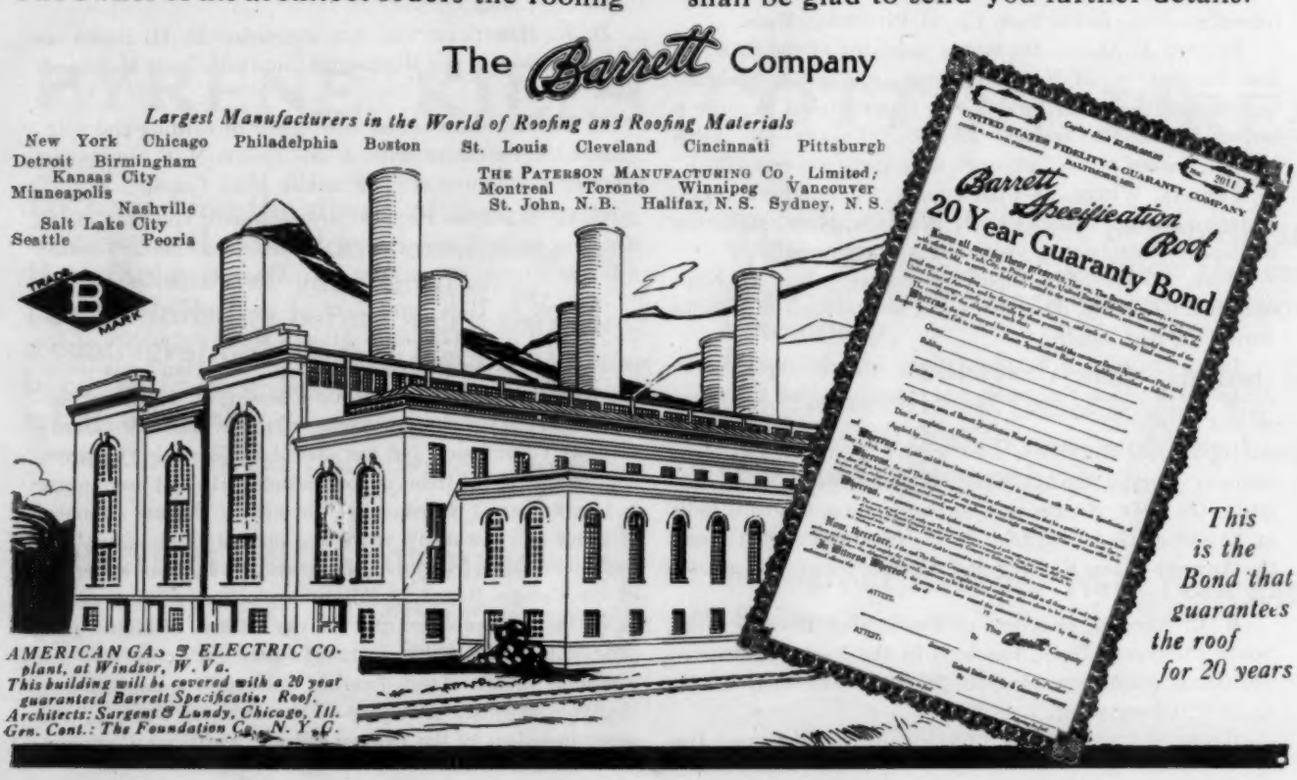

AMERICAN GAS & ELECTRIC CO. plant, at Windsor, W. Va. This building will be covered with a 20 year guaranteed Barrett Specification Roof. Architects: Sargent & Lundy, Chicago, Ill. Gen. Cont.: The Foundation Co., N. Y. C.

This is the Bond that guarantees the roof for 20 years

Notes About Men You Know.

W. S. TRICKETT, formerly superintendent of the Pembroke Mills at Suncook, N. H., has resigned and accepted a similar position at Groveville, N. J., with Morris & Company, Inc. On leaving Suncook, he was presented by the overseers with a handsome traveling bag.

F. GORDON COBB, superintendent of the Inman (S. C.) Mills, has been appointed superintendent of the F. W. Poe Manufacturing Co., Greenville, S. C.

D. D. TOWERS recently resigned as superintendent of the Canton (Ga.) Cotton Mills to accept a similar position with the Hillside Mills, LaGrange, Ga.

W. O. TALLENT, formerly superintendent of the Aldora Mills, Barnesville, Ga., has accepted a similar position with the Glenola Mills, Eufaula, Ala.

CLAUD GORE, secretary and treasurer of the Great Falls Mfg. Co., Rockingham, N. C., has been elected general manager of the Marlboro Mills at McColl and Bennettsville, S. C. His new position will in no way effect his connection with the Great Falls Mfg. Co.

A. H. JACOBY has been appointed manager of the aniline department of the National Aniline & Chemical Co., 100 William Street, New York. Mr. Jacoby was previously manager of the aniline department of the American Dyewood Co., and is well known in the dyestuff and textile trades.

JAMES J. O'MEARA has accepted a position as superintendent of the Fitchburg (Mass.) Yarn Company.

J. B. JAMIESON, JR., formerly superintendent of the Fitchburg (Mass.) Yarn Co., has resigned to accept a position with the Brighton Mills at Passiac, N. J.

CHARLES HAYES, JR., has resigned his position as superintendent of the Grant Yarn Co., at Fitchburg, Mass.

ELLIOTT A. ALLEN, the textile specialist of the S. K. F. Ball Bearing Co., of Hartford, Conn., who makes his headquarters at Worcester, Mass., was a participant in quite a serious automobile accident recently. Luckily Mr. Allen escaped serious injury, although his companion was killed.

FRED H. WHITE, of Charlotte, N. C., Southern representative of the Stafford Co., of Readville, Mass., and other machinery firms, was a visitor in Atlanta recently.

PAUL H. HADDOCK, Southern manager for A. Klipstein and Company, dyestuffs, spent several days in Atlanta during the past month.

DAVID GILFILLIAN, of the Atlanta office of the H. & B. American Machine Company, has recently joined the ranks of the benedicts.

HARLEY L. ROGERS is now master mechanic and chief engineer for the Jno. P. King Manufacturing Co., at Augusta, Ga. Mr. Rogers was formerly connected with mills at Eatonton, Ga., Edgefield, S. C., Clearwater, S. C., and the Augusta-Aiken Railway and Electric Corp., at Augusta, Ga.

R. C. AYCOCK, president of the Aycock Hosiery Mills, South Pittsburg, Tenn., has been in the North purchasing additional machinery for the proposed extension of the South Pittsburg plant.

GARNETT ANDREWS, the president of the Richmond Hosiery Mills at Chattanooga, Tenn., was a recent visitor in the Philadelphia market.

C. H. BACON, treasurer of the Loudon Hosiery Mills at Loudon, Tenn., has been spending several days in the Philadelphia hosiery market.

W. B. DAVIS, the well known hosiery manufacturer of W. B. Davis and Sons, Fort Payne, Ala., has been looking over the northern knit goods market.

GEORGE T. ANDREWS, secretary and treasurer of the Enfield (N. C.) Hosiery Mills Company, attended a recent meeting of knit goods manufacturers in Philadelphia.

WILLIAM E. HALL, treasurer and general manager of the Shaw Stocking Company, Lowell, Mass., has tendered his resignation to the board of directors to become effective December 1st. Mr. Hall has been identified with this company for nearly twenty years. The name of his successor has not yet been announced.

S. M. MCANULTY has resigned his position as master mechanic with the Brown Mfg. Co., and the Norcott Mills Co., of Concord, N. C., and accepted a similar position with the Belton (Tex.) Cotton Mills.

J. MARION DAVIS, the well known manager of the Newberry (S. C.) Cotton Mills, recently announced the marriage of his daughter, Pearl Anna, to M. B. Clisby, of Newberry, on Wednesday, October 18th.

WALTER H. CARTER has been made president of the Delta Cotton Mills at McComb City, Miss. Mr. Carter recently resigned as president of the Mississippi Cotton Mills Co., at Morehead, Miss.

R. H. SMITH, formerly of Morehead, Miss., is superintendent of the recently started Delta Cotton Mills, at McComb City, Miss.

D. R. HARRIMAN, SR., has succeeded R. H. Smith as superintendent at the Mississippi Cotton Mills, at Morehead, Miss.

P. K. DRY has resigned as overseer of carding and spinning at the Patterson Mills, China Grove, N. C., to become overseer of spinning at the Franklin Mills, Concord, N. C.

C. H. SEARS has resigned as overseer of spinning at the Franklin Mills, Concord, N. C., to accept a similar position with the French Broad Mfg. Co., Asheville, N. C.

JUDSON L. HAND, president of the Pelham (Ga.) Mfg. Co., died at a sanitarium in Atlanta about the middle of the past month, of acute Brights disease. Mr. Hand was prominent in the business world and a leader in Georgia's political affairs. He was a member of the Western & Atlantic Railway Commission and had served ten years in the House and Senate of the Georgia Legislature. He had been mayor and a member of the council in the city of Pelham a number of times and for many years was intimately identified with the public life of his town and county. He was a member of the County Board of Education for many years as well as of the finance committee of the county. Besides being president of the Pelham Manufacturing Co., he was also president of the Hand Trading Company, a general merchandise concern; president of the Farmers Bank of Pelham; president of the Pelham Oil and Fertilizer Company;

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Pyrene kills fire before it can roar into a conflagration. Safe in electrical fires because it contains no moisture and is an absolute non-conductor. Kills oil or cotton fires that water usually spreads. Won't freeze or deteriorate. Will not damage or corrode the contents of your stock room or your machinery.
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president of the Flint River and Northeastern Railroad; and vice president of the Albany Phosphate Co. For a number of years past he was also president of the Abbington Cotton Mills.

Z. V. GRAY, formerly with the Loray Mills at Gastonia, N. C., has accepted a position as overseer of spinning with the Republic Cotton Mill Great Falls, S. C.

JOHN RILEY has accepted a position as overseer of mule spinning for the Delta Spinning Mill, at Frankford, Philadelphia, Pa. Mr. Riley was recently connected with the Quidnick-Windham Company at their Williamantic plants and was later located at Adams, Mass. This is the second time he has been employed at the Delta Spinning Mills, having served in this same capacity about four years ago.

B. E. GEER, president of the Judson Mills and the Katrine Manufacturing Company, was recently elected president of the Southern Textile Exposition, Inc., in the place of W. P. Anderson, who declined the position on account of ill health.

T. V. TERRELL, secretary and treasurer of the Locke Cotton Mills Company, at Concord, N. C., died on October 20th, as a result of injuries received in an automobile accident. Mr. Terrell had been secretary, treasurer and manager of the Locke Mills since last April. He was formerly connected with the Asheville Cotton Mills, and later with the Cooleemee Cotton Mills. He was a director in the Irwin Cotton Mills Co., of West Durham, N. C., the Bank of Cooleemee and a member of the firm of the J. N. Ledford Company, as well as being president of the Cooleemee Company.

H. C. DWELLE has resigned as secretary of the Erlanger Mills, Lexington, N. C., and will organize a knitting mill at Charlotte, N. C.

W. J. HOARD, secretary and paymaster of the Mississippi Mills, Moorhead, Miss., is now acting also as president.

EUGENE CROSS has resigned as superintendent of the Taylorsville (N. C.) Cotton Mills to begin the erection of a new mill which he has organized at Marion, N. C.

GEORGE LAYFIELD, of Columbus, Ga., has accepted position as overseer of spinning at Manchester Mills, Macon, Ga.

G. H. LOCKEY, of Ware Shoals, S. C., has accepted the position of overseer of carding at the Winnsboro (S. C.) Mills.

J. H. ARRINGTON has resigned as overseer of spinning at the Manchester Mills, Macon, Ga., to accept a similar position at Cochran, Ga.

W. A. RIDDLE has been promoted from carder and spinner to superintendent of the Roberta Mill, Concord, N. C.

M. P. STACKS has resigned as carder and spinner at the Anchor Cotton Mills, Huntsville, N. C., to become superintendent of the Johnston Mfg. Co., Charlotte, N. C.

PETER OLIVER, formerly overseer of the duck and bag weaving department for the Boott Mills, Lowell, Mass., and more recently with the Tremont & Suffolk Mills of Lowell, Mass., as second hand in the weaving department, has taken a position as night overseer of weaving for the Jenckes Manufacturing Co., Pawtucket, R. I.

MELVIN WHITAKER has returned to his former position as overseer of spinning at the Linn Mills, Landis, N. C.

ED. NETHERLAND has resigned as carder at the Glenola Mills, Eufaula, Ala., to accept position as overseer of carding at Manchester Mills, Macon, Ga.

GEO. SMITH has resigned his place at the Linden Mill. Davidson, N. C., to become overseer of carding at the Gem Yarn Mills, Cornelius, N. C.

S. P. MCLESTER has accepted position as overseer of carding and spinning at the Patterson Mfg. Co., China Grove, N. C.

J. R. FEDERLINE, JR., has resigned as overseer of spinning at Seneca, S. C., to accept a similar position with the Caraleigh Mills, Raleigh, N. C.

EDWARD HANSON, formerly overseer of the cloth room for the Merrimack Manufacturing Co., Lowell, Mass., but more recently overseer of the duck finishing department for the Boot Mills, Lowell, Mass., has taken a position as overseer of the finishing department for the Williamsville Manufacturing Co., Killingly, Conn.

R. G. WRIGHT has resigned as carder at the Manchester Mills, Macon, Ga., to accept a position with Unity Spinning Mills, LaGrange, Ga.

O. L. GRICE, formerly night carder and spinner at the Belmont Mills, Shelby, N. C., is now night overseer of carding at the Gray Mills, Gastonia, N. C.

J. C. PLATT, formerly superintendent of the French Broad Mfg. Co., Asheville, N. C., has accepted similar position with the Necronsett Mills, Cumberland, N. C.

JOHN H. GREER, JR., has accepted a position as chemist for the Holland Aniline Co., Chicago, Ill., and Holland, Mich. Mr. Greer is a graduate of the Lowell Textile School.

SAMUEL TAYLOR has been appointed superintendent of the Hocheloga Cotton Mills, of the Dominion Textile Co., Montreal, Canada.

W. H. MOONEY resigned as superintendent of the Bibb Mfg. Co., Columbus, Ga., to accept a similar position with the Canadian Cotton Company, Sherbrooke, Canada.

WINFIELD BEASLEY has been appointed superintendent of the Garner Print Works & Bleachery at Wappingers Falls, N. Y. Mr. Beasley has been in the employ of the bleachery at Wappingers Falls for a number of years.

ROBT. CHAPMAN has resigned as president and general manager of the Marlboro Mills, McColl, S. C., and accepted the position of secretary and treasurer of the same company.

T. B. CAMP has resigned his position with the Edna Cotton Mills, Reidsville, N. C., to become overseer of No. 1 spinning room at the Dan River Mills, Schoolfield, Va.

I. L. BRITT has resigned as overseer of spinning and winding at the Bladenboro (N. C.) Cotton Mills to accept a similar position at the Maple Mills, Dillon, S. C.

R. A. WILLIAMS has been promoted from second hand in spinning at Easley Cotton Mills, Easley, S. C., to overseer of spinning at the Easley Cotton Mills No. 2, Liberty, S. C.

ALONZO MASON has been promoted to overseer of spinning and twisting at the Tallassee Falls Mfg. Co., Tallassee, Ala.

LEIGH STANLEY BACHE, of Bound Brook, New Jersey, son of the late Martha E. Bull and Captain William Henry Bache, died at Muhlenberg Hospital on Thursday, September 21st. He was born near Jamestown, New York, September 18th, 1870. Mr. Bache came to Bound Brook in 1889 and since that time has been connected with the Bound Brook Oil-Less Bearing Company, and for the past five years as 1st vice-president and general manager of that company. Mr. Bache was a 32d degree Mason, Knight Templar, Shriner, Royal Order of Scotland, Knight of Constantine and an Elk.

How Other Men Manage

Practical Discussions by Cotton's Readers on all varieties of Mill Subjects

Answers "O. K."

EDITOR COTTON:

In replying to the first question from "O. K. Mississippi," relative to the value of break draft, the writer will say that it is of no practical importance. It is the draft between two sets of rolls not directly connected by gears. For instance, the third roll being driven by a long train of gears from the delivery roll, and the second roll being directly connected to the delivery roll, the break draft lies between the second and third rolls. It may be calculated by computing the total draft and dividing it by the product of the draft between the third and fourth and between the first and second rolls.

Coming to the second question as to the best method of driving the rail on hosiery yarn, there seems to be a wide difference of opinion among mill men over the South with reference to this problem. The writer favors binding from shoulder to nose, or having the rail travel fastest going up. We will take the case of the rail moving at its slowest and laying the coils close together on the downward stroke; as the change to the fast speed is made at the bottom, a slight increase in balloon of the yarn will be noticed, which means a relief of tension. On the other hand if the rail changes to its fastest speed at the top, the opposite effect is produced. As stated, when binding from shoulder to nose there is a slight release in tension on the change, there will necessarily be a corresponding increase in tension when binding from nose to shoulder. The rail then has its fastest speed in the same direction as the yarn is traveling and tends to pull it from the rolls. With this method the traveler, at each change to fast speed, digs into the surface of the ring wearing it wavy. The only objection to the first system is the increase in the balloon, which is easily remedied by a properly weighted traveler.

The third question relative to the slowing up in speed of the rail as the bobbin fills up is rather difficult to clearly explain without a drawing, which the writer cannot give. Anyone familiar with the construction and operation of a builder motion on a warp frame knows as the bobbin fills, the rack carrying the chain which operates the rail is wound back, or toward the center of the frame. As the rack is wound back it is moved nearer the fulcrum or pivot point of the arm operated by the cam. This gradual decrease in distance between the rack and pivot point of the arm causes the ring rail to slow down as the bobbin fills. The explanation of this is as follows:—A point on any lever pivoted at one end, having a constant speed through a given up and down stroke increases in speed as the distance from the stationary end is increased; because the outer end moves through a greater arc in the same length of time as a point nearer the pivot moves through a shorter arc, which necessitates the outer end moving faster. Therefore as the rack winds back, the arc is decreased and the chain controlling the rail is moved slower. It takes the rail the same length of time to make its shortest stroke as it does its longest, because the rail is operated by a cam which has a positive gear drive and which gives a constant speed, therefore it requires the same length of time for the cam to make one revolution at the end as at the beginning of a set.

In replying to the fourth question, the writer contends there is a slight variation in the twist per inch on an empty and a full bobbin. It seems to be an accepted practice among mill men to divide the inches per minute delivered by the front roll into the r.p.m. of the spindle to secure the twist per inch, which is not accurate. We know that should the traveler move at the same speed as the bobbin the twist would be inserted, but no winding on would take place, therefore the traveler must lag behind a number of revolutions equal to the number of revolutions of the bobbin necessary to wind up the yarn. As the bobbin builds up this number of revolutions decreases, hence the slight increase in twist per inch. For example we will assume an empty bobbin one inch in diameter, full bobbin 1½ inches, with a spindle speed of 8000 r.p.m. and front rolls delivering 400 inches per minute. Then $1 \times 3.1416 = 3.1416$ inches, circumference of the empty bobbin. $400 \div 3.1416 = 127.3$ r.p.m. of empty bobbin as the speed necessary to wind up the yarn. $8000 - 127.3 \div 400 = 19.68$ turns per inch on the empty bobbin, $1\frac{1}{2} \times 3.1416 = 4.7124$ inches, circumference of the full bobbin. $400 \times 4.7124 = 84.8$ r.p.m. of the full bobbin as the speed necessary to wind up the yarn, $8000 - 84.8 \div 400 = 19.78$ turns per inch on the full bobbin. $19.78 - 19.68 = .10$ of one turn difference in twist per inch between the empty and the full bobbin. This calculation answers the second division of this question, and shows the traveler goes faster on a full bobbin, also a larger bobbin would increase the twist per inch.

W. G. (Georgia.)

EDITOR COTTON:

(1). The term "Break Draft" is used to define the draft between the middle and back rolls of spinning and roving frames. This draft is small and ranges from 1.05 to 1.09 in spinning frames. The effect of this draft can be seen as the fibers pass from the back to the middle rolls. At this point part of the twist has been removed, allowing the front roll to draw the fibers more uniformly.

(2). The filling wind with the quick upward traverse has a mechanical advantage, in that the weights which balance the ring rail move in a downward path during this part of the wind. The slow downward traverse allows the weights to be raised at a slower rate of speed than if the

alternate system of filling wind was in use. The advantage of a quick downward traverse is better for filling yarn. In unwinding, the yarn comes off the bobbin more uniformly.

(3). The ring rail receives its motion from the builder cam which has a uniform rate of speed. The traverse of the ring rail is reduced at each layer by the shortening of the builder rack. This shortening of the builder rack reduces the throw of the quadrant which controlls the movement of the ring rail. It takes the same length of time for each traverse, whether the traverse be short or long.

(4). For all practical purposes we can say the twist is uniform throughout the build of the bobbin. Theoretically it is not and to prove this the following illustration is given. Front roll 1 inch diameter, front roll gear 91, twist gear 36, stud gear 91, cylinder gear 24, cylinder 7.50 inches diameter, spindle whirl 1 inch, empty bobbin ¾ inch and full bobbin 2 inches. Suppose the front roll delivers 100 inches, then it must make 100 divided by 3.14 revolutions. The following equation will give the revolutions of the spindle while the front roll has delivered this 100 inches of yarn:

$$\frac{100\times91\times91\times7.50}{3.14\times36\times24\times1}$$

=2287 revolutions of the spindle. 3.14×.75=2.355 inches circumference of the empty bobbin, 100 inches divided by 2.35=42.5 revolutions of the bobbin to wind 100 inches, 2287 minus 42.5=2244.5 revolutions of the traveler with a delivery of 100 inches of yarn, 2244.5÷100=22.44 twists per inch when bobbin is started. When the bobbin is 2 inches in diameter, the bobbin will wind 3.14×2=6.28 inches per revolution. 100÷6.28=16 revolutions of a 2 inch bobbin to wind 100 inches of yarn. 2287 minus 16=2271 revolutions of the traveler, 2271÷100=22.71=twists per inch when bobbin is 2 inches in diameter. 22.71 minus 22.44=.27 difference in twist between the empty and the full bobbin.

(5). The traveler has its fastest speed when bobbin is full. This can be readily understood by the answer to the 4th question.

H. K. (North Carolina.)

EDITOR COTTON:

The term "break draft" is of very little practical importance. Break draft is a draft between two contiguous pairs of rolls that are not directly connected by means of gears, and is found on any machines in which this condition exists.

2. The "traverse ring rail" going up the fastest is, in the writers opinion, the best. With the ring rail going down the fastest it would have a tendency to pull the ends away from the rolls and causing many ends to be broken. Some men will say that by running your ring rail down fastest you can use a lighter traveler (which you can) and that by running your rail up fastest you would tend to make soft bobbins and that the yarn would come off the bobbins in bunches, but neither of these claims will stand up under tests. If the frame is so adjusted as not to make the taper too short and everything else is in good condition, the writer does not think that the advantage in using the lighter traveler with the rail going down fastest would overcome the disadvantage of having the yarn broken which would occur under these conditions. Take two frames on, say 18's with a multiplier of 2.75 or 3.00 and try one each way it won't take you long to find out which is best.

3. The reason why it takes the "ring rail" the same time to make the shortest as it does the longest layer on a warp wound bobbin is very simple to my mind. When the frame is started on an empty bobbin, the rack is as far toward the front of the frame as it will go and the point at which the chain connects to the rack is correspondingly farther from the cam-bowl, and as the frame fills up and the rack is moved toward the back of the frame, it brings the point at which the chain connects with it (the rack) closer to the cam-bowl, or in other words it acts as a lever.

4. The twist is not uniform in any ring-spun yarn, the difference is when the rail is going up the yarn is being wound on the bobbin faster than when the rail is going down and does not have as much time between the rolls and the bobbin as when the rail is going down therefore the frame puts in more twist when the rail is going down than it does when it is going up; and the more twists per inch being put into the yarn, the more the twist will vary.

5. The traveler has it's greatest speed when the bobbin is full due to the diameter of the full bobbin; in other words the traveler has to go around more times in order to get one turn on the full bobbin than would be the case with the empty bobbin. In conclusion I will say that I think O. K. is possibly a good mill man and knew everything he has asked in order to see if anyone else knew.

Honest Bill (Ky.)

EDITOR COTTON:

1. Break draft is spoken of as the draft between the third and second rolls of a drawing frame. That is, the draft effected by changing the draft change gear. Therefore, I suppose, one could call the draft between the second and first rolls of a spinning frame the break draft.

2. Personally, I prefer to run the ring rail faster when going up, though I think it makes no material difference on filling yarn. I do not know how it would be on hosiery yarn.

3. I know of no slow motion for the ring rail when the bobbins are full, because the builder cam makes the same r. p. m. whether the bobbins are full or empty. While the taper motion shortens the distance which the ring rail travels, it does not alter the speed of the builder cam.

4. No. The larger the bobbin grows the more twist there is put into the yarn, though the difference is but little. Suppose the front roll delivers thirty inches of yarn a minute and the spindle runs 9000 r. p. m. When the bobbin is empty—say three-quarters inches in diameter it will take 12.76+ revolutions to wind on the yarn. With a full bobbin—say two inches in diameter, it will take 4.77+ revolutions to wind on the yarn. Therefore, when the bobbin is full the 7.99 or say 8 r. p. m. of the bobbin, difference, go into the twist.

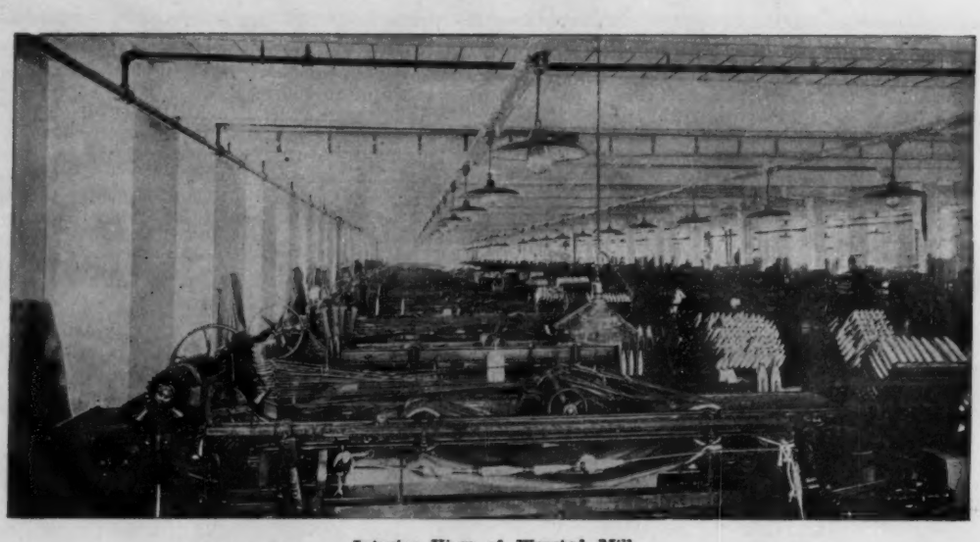
5. When the bobbin is full.

Franconia, (N. H.)

EDITOR COTTON:

(1). The value of "Break Draft" is obvious to most, spinners especially, and is used to keep the roving from running out at the side of the middle rolls. Where there are long drafts, evener yarn can be made with some "break draft". With "break draft" more twist may be used in the roving, as the roving gets broken between the back and middle rolls and makes it easier on the front rolls thereby giving better running work. Spinning of any kind should not

CHAFFEE'S MILL WHITE MAKES DAYLIGHT



Interior View of Worsted Mill.

CHAFFEE'S MILL WHITE

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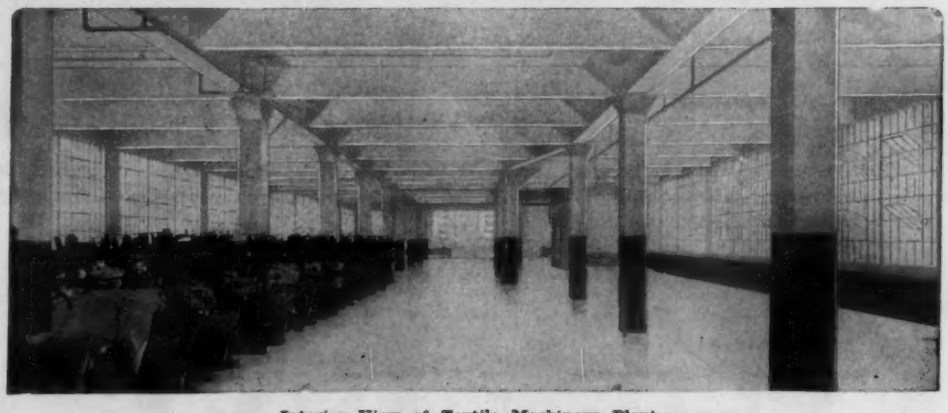
ADDED LIGHT—LOWEST ULTIMATE COST—SANITARY FINISH



Interior View of Textile Machinery Plant.

Wouldn't it pay you right now to investigate the merits of this Sparkling, Shadow-chasing White Paint, which has proven its efficiency in hundreds of the largest mills? What we have done for others we can do for you.

Interior View of Silk Mill.

WRITE TODAY for Descriptive Booklet and Paint Panel

Thomas K. Chaffee Co. Providence, R. I.

CHAFFEE'S MILL WHITE MAKES DARK CORNERS LIGHT

YARN is improved in quality and strength by the Union Ring and traveler. Five hundred rings were run by a mill for nine months for a durability test. The mill made its own tests and for its own purposes. Numbers from 12's to 40's were run, both warp and filling, many different kinds of roving used, including that made from waste, and the speed ranged from 8,500 to 12,000. Below is one of the test sheets from a competitive test made for strength. In this test the mill used two large Whitin frames fitted as follows:—256 common rings, run at 9,000, and 256 Union rings run at 12,500, same roving and same conditions on both; 20 bobbins were spun on one frame and then the same bobbins of roving were shifted to the other and 20 bobbins spun on that frame. The table below shows the results of this test. In addition the Superintendent of the Mill wrote us that the collective tests showed an average better strength of 7 per cent, 40 per cent increase in quantity, and a softer drag on the yarn, and "that the rings ran very satisfactory." We do not recommend a spindle speed of over 10,500 r. p. m.

UNION

Air Cushioned Ring

Union Rings 12,000 Rev. per m. Size	Pounds strain to break		Common Rings 9,000 Rev. per m. Size	Pounds strain to break
22.03	122	(1)	22.03	118
22.57	120	(2)	22.57	108
22.73	126	(3)	22.73	125
22.47	123	(4)	22.47	119
22.47	120	(5)	22.47	119
22.22	119	(6)	22.22	122
24.21	108	(7)	23.64	103
21.51	127	(8)	21.65	120
21.93	123	(9)	21.98	119
22.83	118	(10)	22.73	116
21.88	127	(11)	21.98	126
23.42	116	(12)	23.09	116
22.12	123	(13)	22.22	122
21.74	124	(14)	22.22	121
21.74	124	(15)	22.32	115
22.78	122	(16)	22.99	113
22.08	122	(17)	23.81	110
22.12	120	(18)	23.53	110
24.10	110	(19)	22.32	124
23.26	117	(20)	23.81	110
22.51	120		22.64	116

UNION

Floating Self-Lubricating Traveler.

Mr. F. R. Chadwick, of Charlotte, N. C., our Southern Manager, writes us under date of Oct. 3, 1916: "I have put one of the rings to a test at a mill in this city, and the Superintendent has just reported to me that the yarn spun on this ring breaks fully 5 pounds stronger, further, that it is free of thin places, feels softer and is much better looking yarn. He is much interested in securing enough rings for a test, and if satisfactory, increasing speed and eliminating night work."

For Further Information and Booklet, Write to The

UNION MFG. CO., 21 Doane Street, BOSTON, MASS.

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CAMS AND ROCKER SHAFTS

WE MAKE THE OLD ONES AS GOOD AS NEW

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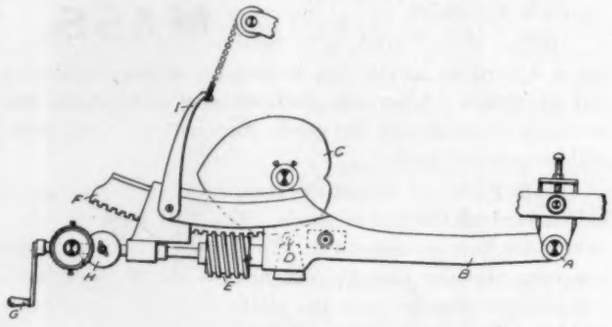
have less than a 0.1 draft between the back and middle rolls, which is termed the "break draft". However, this is like most everything else, it must be governed according to conditions, such as stock used, number spun, draft, etc.

(2) On hosiery yarn, building a filling wound bobbin, it is much better for the running of the spinning to run the traverse fast going up and slow going down, especially if the spinning is high speeded. But with the traverse running this way, trouble may be had from the yarn roving off or kinking up, and as good a bobbin can't be built running in this way as with it running in the opposite direction. There also will always be more waste from the winder room than would be the case with the traverse in the opposite direction. If running the spinning over standard speed, I would suggest that the traverse be run fast going up; if not, I would suggest the opposite direction. The traverse going up fast and down slow, is best on the running of the work, because the most of the ends that come down on a filling traverse will be pulled down when the traverse is going down at the high speed, especially so where the frames are speeded high. With the frames running standard speed or under, with a little extra twist in the yarn, better results will be secured with the traverse going up slow and down fast, as more yarn may be placed on the bobbin and have less waste.

(3). When a traverse on a warp frame is wound out, (to start on an empty bobbin) it has its longest leverage, (on



the builder) or stroke, as the traverse chain is then at its greatest distance from the cam roll, D, (see drawing). Thus every complete stroke (or round) of the traverse runs the builder rack, F, (to which the traverse chain is fastened) back closer to the cam roll, D, thus, of course, shortening the traverse every stroke and causing it to run just a little slower until the frame (or bobbins) are full. Now as the cam C makes the same r. p. m. at all times, and the builder B, is hung on a stationary stud, A, it is at once evident that the distance from the cam roll D to the traverse chain is variable, and the longer the stroke (or traverse) is, the faster it will go up and down. When the bobbins get full the traverse chain is back close to the cam roll, making its shortest stroke, but as it takes the cam just as long to mate a revolution now as it did when the bobbins were empty, it also takes just as long for the builder to go up and down, but as the traverse chain has now but a short leverage, it will run slower, taking the same time to go up and down as it did when the bobbin was empty.

I think by studying the drawing or sketch, "O. K." will be able to understand this. If "O. K." will take notice of a frame empty and one full, he can see more readily how it works. A, the builder stud is hung on B, the builder; C is the cam; D the cam roll; E the traverse worm; F the traverse rack; G, the traverse key; H the ratchet gear; and I, the chain hook (where the traverse chain is hooked.)

(4). The twist is not uniform throughout the build of a warp bobbin. The difference is not great at all, but will vary according to size of the bobbin, the ring and the twist per inch, number of yarn, speed, etc., but in about the same proportion.

Example: We will assume an empty bobbin is 3-4 inches in diameter (2.34 inches in circumference) and the full bobbin is 1 3-4 inches in diameter (5.49 inches in circumference). If the traveler is held stationary and the empty bobbin given one revolution, there will be 2.34 inches of yarn, while with a full bobbin, one revolution will wind 5.49 inches. If the bobbin makes 8000 revolutions while the front roll delivers 400 inches of yarn, the twist will be 20 turns per inch. The empty bobbin will have to make 170.21 revolutions. 400÷2.35=170.21. The traveler will make 7,829.79 rotations or the speed of the bobbins less the number of rotations necessary to wind the yarn 8000—170.21= 7,829.79. At each rotation of the traveler, the yarn receives one twist, so the actual twist per inch will be 19.57.

With the full bobbins, 72.85 revolutions are necessary to wind the 400 inches of yarn, delivered by the front roll. 400÷5.49=72.85. The traveler will then make only 7,927.15. rotations. 8,000—72.85=7,927.15. The difference in the twist per inch between a full bobbin, 1 3-4 inches in diameter and an empty bobbin, 3-4 of an inch in diameter is the difference between 19.81 and 19.57 or .24 of one turn in a length of 400 inches. To find the actual twist, divide the revolutions of the spindle, or bobbin, less the number of revolutions necessary to wind the yarn on the bobbin, by the inches of yarn delivered by the front roll in the same length of time, thus, 7829.79÷400=19.57, and 7927.15÷400=19.81. So it will be seen that the larger the bobbin gets the more twist the yarn receives.

(5). The traveler has its fastest speed when the bobbin is full, as has been shown.

H. J. M. (North Carolina.)

To increase the earnings on every invested dollar is what the wideawake boss is working for. He applies his intimate knowledge of the little, as well as the big things, to that end. In other words, he is striving for efficiency. A great aid can be rendered to the textile manufacturer in the way of the accessories he needs in his trade by The Arabol Mfg. Co., 100 William St., New York City, whose complete line of staples is suited for the various finer processes of turning out the finished goods. Textile men learn what Arabol service means when they see the results achieved in their shops. Arabol warp sizes, finishes, softeners, weighteners, soluble waxes and soluble oils, etc., help solve many of the manufacturers' problems.

Henry L. Scott & Company announce the removal of their office and factory to their new building, Blackstone and Culver Sts., Providence, R. I. The new factory has been thoroughly equipped with modern machinery and special appliances and will be devoted exclusively to the manufacture of testing machines and apparatus. A cordial invitation is extended to visit the plant and examine the latest models.

Some Shrewd Tricks to Cheat the Mill.

EDITOR COTTON:

I doubt if there is any overseer of experience but has sometime run into some shrewd trick of an operative to put something over on him with the intention of cheating or defrauding. It is strange, but many otherwise honest people will not hesitate to pull any stunt that they think they can get away with "to beat the company" as they call it. Now I am sure I have not seen all the tricks possible but I have run across a few and some overseers, especially those younger in experience, may be interested in learning of some of the things I have witnessed, and may profit by having their eyes opened, and enable them to locate these things when they occur.

I suspect more of these tricks are pulled in the weave room than in any other department, yet I doubt if any part of the mill is free from some of them.

To beat the Cut Board is one of the greatest aims desired and I have seen it tried in many and divers ways. Where cloth is marked off for bad places, as is practiced in many mills, some weavers arrange to nearly always have a bad place requiring marking when the roll is only about two thirds the full size. I have known weavers to become so bold in working this trick, that their boldness alone proved their undoing. One certain weaver of my experience made a practice of getting over 100 per cent of possible production for months, yet those in authority knew he was no better weaver than many others in the same mill. This alone put the managers on guard and only by keeping a tabulated record of yards as folded in the cloth room and checking them against the cut sheet was the trouble finally located to the satisfaction of all concerned.

Another trick to this end is the making of additional cut marks on the warp. The inexperienced usually make such a "bum" job of this that it shows at first sight, but I have known weavers to become so expert at the trick that only a careful inspection of the cloth, tacking each mark as it comes up, would reveal the fraud.

This is something mill managers will always have to look out for.

The substitution of pickgear is another trick sometimes worked. I remember once working in a large mill where one or two weavers were pulling this stunt and their record was being held up as an example by the overseer of the room to all the other weavers. Things went on this way for many months until a kick from the buyer came in, claiming the goods both off weight and off pick. A big concession had to be made and an investigation disclosed the substituted gears. These weavers and also the overseer lost their jobs.

Another offender of this nature was caught by a mere accident. Several pieces of such goods woven by a certain weaver chanced to get in a single bale in the cloth room and the yards per pound were so far off that an investigation revealed the truth.

This trick is not so common and especially in mills constantly changing from one class of goods to another, but where standard goods of the same pick, like print cloth, chambrays, ginghams, etc. are continuously woven on the same loom, managers may well look out for it, for sooner or later it is bound to appear.

A peculiar experience was observed once and only once, yet at any time possible. In a certain mill a weaver was getting an abnormal production. We knew something was wrong and we looked for all the usual tricks even to checking up the gear, but was baffled. At last, when about to give up, we chanced to examine the tin on the sand roll of the loom and found that it had been taken off and several thicknesses of paper wound upon the wooden rolls, and the tin replaced, thus making the rolls larger and thereby drawing the goods over faster. I always thought this weaver had a confederate in the loom fixer.

Another confederate job was put up once in this manner. The slasher tender had several members of his family all weaving on a particular kind of goods, and when running these warps he changed the gear on the cut marker so as to have these cuts run 10 yards shorter. This went on for several months before it was caught.

Next to beating the cut board, getting bad work over is the next most popular aim at which various and shrewd tricks are tried. Where looms are numbered separately I have known weavers to mark their cloth up to some other weaver's loom number, letting them get pay for it and stand the dockage, or prove an alibi as best they could, while the real offenders would raise a row when the cut board was hung up and claim they had been beaten out of so many cuts of cloth, as the looms showed that cloth was doffed off them the preceeding day. The second hand or overseer usually pays them for the cloth and charges it to his having made a mistake.

Another shrewd trick is to have an apron or piece of goods a yard in length and in this apron they wrap the roll of goods. After the cloth checker has passed this apron is removed and the goods goes into the cloth room with no number on it.

Another trick of almost the same nature is to tear about half a yard off the roll of goods. This half yard of course having the loom number on it. To this end, where overseers are very exacting that the cut mark show on outside of the roll, the weaver runs the cloth about half yard over and tears it off back at the cut mark.

Another trick, shrewder still, is to put the number in very small figures and so near the outside end of the goods that when it is stitched into rolls into the cloth room, this number is sewed up in the seam at the stitcher and cut out with it at the folder, or where the folder hand rips instead of tears the goods, the number having been in the seam right on the edge, is usually so mutilated and frayed as to be almost indistinguishable.

Once I ran into some weavers who had a habit of tearing a small string of selvege back at the end so as to make it necessary for the stitcher hand to tear off enough of the goods to destroy their number and if the stitcher hand put the number back on the goods when these weavers were called to the cloth table they would ask to see the original number and when shown the end of the goods where the stitcher hand had replaced their number they would declare it was not their writing and thereby prove an alibi that usually went through.

I am sure there are many other tricks equally as shrewd or perhaps shrewder but these are a few of my observations that I think worthy of record and of some probable value.

Toothless Tom (Georgia).

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Thoughts from the Card Room.

EDITOR COTTON:

Does an efficient card grinder have to have a keen hearing? I am led to this thought by the troubles of a man who was discharged after more than twenty years of satisfactory service as a card grinder, because a new man above him, with efficiency ideas, discovered his imperfect hearing. I contend that a man can grind a card perfectly even when deaf. Read almost any textile book, and it will tell you that grinding must always be controlled by sight, hearing and touch. This I believe is a wrong statement. Sight is the most essential feature in grinding cards.

I submit the following rules for card grinding:

Set the wheel to a 5/1000 gauge, the same with the dead-roll when grinding the flats. Next gradually bring the wheel or roll into close touch with the wire until a spark or two can be seen. Try it on each side of the card, on both the cylinder and doffer, and the most perfect edge on the points of all the wires will result.

Of late, a great deal of interest has centered on roll weighting.

On roll weighting I have my own opinion, and, like most other overseers, I, too, of course, think I am dead right. Once, when superintendent of a New York mill, I had 40's yarn breaking around 60 pounds. This was accomplished by using self-weighted rolls. The stock used was a mixture of Sea Island and Peeler cotton. When the same weighting was used for a shorter cotton and heavier work, the self-weighted rolls made the yarn much weaker than the weighted rolls. Why?

A fly frame will run better when using long stock, even when the hank is much higher, for the reason that the fibers are longer and stronger, which serves as two extremes.

(1) The fibers being longer than the distance from the termination of the paddle and up to the first turn of the roving around the presser finger, prevents the pull (due to the unequal conditions found on all fly frames) from pulling the strand apart. In other words, the strand is stronger than the compactness of the bobbin, and instead of the strand giving way, the surface of the bobbin is reduced and thus conditions adjust themselves, and this results, of course, in a less breakage of ends when running fine work.

(2) Long stock is as a rule always stronger than short stock. On the other hand, when the stock is shorter than the distance stated in the previous paragraph, aided by the weakness of the stock, the strand is pulled apart, because the increasing diameter of the bobbin is stronger than the strand, which is the cause of the ends snapping here and there. Changing the rack gear will not remedy it, because the bobbins are not of the same diameter when running poor stock.

When self-weighted rolls are used for long stock, the stock is drawn from under the self-weighted roll, in other words, as in the case of the distance from the termination of the paddle and the first turn of the strand on the presser finger, the fibers are stronger than the grip offered by the self-weighted rolls, so no fiber escapes being drawn and at the same time not receiving a too severe treatment. On the other hand, if self-weighted rolls are used for short stock, the grip of the front roll due to more weight, will pull the fibers in clusters, which will make uneven yarn. Owing to the less weight of the middle roll, the draft of one is not attained between the second and third rolls, which causes the yarn to be heavier but weaker, because the twist will run to the light places in the yarn, which makes the heavy places the weaker, and causes the yarn to break poorer than a yarn made from a heavy middle weighted roll and a lighter weighted front roll.

The idea is the same as on the combers, if strong yarn is wanted, just take a little weight off the front roll, and the difference in the breaking strength of the yarn will be a surprise. This is an old trick among comber men.

There is always a dual operation between the first and second rolls when more weight is on the second, and the evenness and strength of the yarn depends on the gradual drawing of the fibers by the front roll from the second roll.

Wash. (N. H.)

Drawing Frame Kinks.

EDITOR COTTON:

Drawing frames can be divided into two classes, those with common rolls and those with metallic rolls. Each can be equipped with the mechanical stop-motions or electric stop-motions.

Drawing frames with common rolls should have the rolls scoured at least every two months, when newly varnished top rolls should be put in, care being taken that the rolls have an even surface, and that the leather has not become loose.

The front top rolls should be varnished every week, and at the same time the other rolls should be looked at and all defective rolls taken out and good ones put in their place.

Drawing frames equipped with metallic rolls should be scoured at least once a month, and the top roll bushings soaked in kerosene oil to clean out the dirty oil that is on the inside of the bushings. By cleaning the bushings in this manner the top rolls are not so apt to become hot when the frames are running at the high speeds found in some mills.

The electric stop-motion has advantages over the mechanical stop-motion and vice-versa, and it is only a matter of opinion as to which is the better.

The spoons at the back and the condensers at the calender rolls should be perfectly balanced to insure a quick stoppage of the frame when an end breaks, while on the electric stop-motion the dynamo needs careful looking after to see that it is making power enough to stop the frame when the circuit is completed. Any dirt getting on the preventer rolls at the back, will stop the rolls from completing the circuit, and as a result one end less will be run through the frame, causing light sliver and consequently light and uneven yarn.

One advantage of the electric stop-motion over the mechanical stop-motion is that when an end breaks at the back, on the electric motion, the tender has to lift up the top preventer roll to piece up, and put it back in place before starting the frame, while on the mechanical system the tender often holds the shipper handle with the frame running and throws the end in between the rolls, sometimes running two or three yards before the end catches between the rolls, thus making uneven work.

H. E. F. (Mass.)

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A Hosiery Manufacturer's Stock Record

BY RALPH H. BUTZ.

The manufacturer of hosiery and other varieties of knit goods who is in search of an accurate and comprehensive stock record system, by which he can keep his inventory complete in every detail at all times, is often perplexed after studying a large number of forms and methods, none of which are exactly suited to his needs. Many stock keeping systems require such a large amount of clerical work as to render them almost prohibitive, while others that are more readily kept lack the required attention to sizes and other important details.

The manufacturer of knit goods who ships his finished product to commission houses or to his own metropolitan stock rooms can easily realize the importance of having an accurate record by which he can check up the "stock on hand" figures which the selling agents render at stated intervals.

Some manufacturers are in the habit of waiting until the end of the month to check up the shipments and sales, and then comparing the result with the commission house report. Where this system is in vogue there is usually a certain amount of negligence in the bookkeeping department, and there are many possibilities to make costly errors, not mentioning the valuable time that is frequently wasted at the end of the month, the busiest period in the office, to look up differences in stock which really are no differences, but errors due to inefficient systems.

The well informed executive is not satisfied to know the quantity of stock on hand at the end of the month, he wants to know at any time when necessity requires it. The stock record must be kept up to date. In this feature lies its usefulness.

The stock record form here shown is very simple, easily understood by almost any clerk at a glance, and yet it can be used by practically every manufacturer of hosiery. It is also adaptable for various other classes of knit goods.

Practically every stationer can supply suitable loose leaf blanks with the proper rulings when the manufacturer does not care to have the forms printed for his special requirements. The loose leaf feature is necessary because it is easy to insert pages where they are required, which can not be done when a bound record book is used.

The following explanation will be sufficient to give a thorough knowledge of this form:

November 1—The manufacturer has checked his figures with those of the commission house and enters his stock on hand, which consists of the following: 170 dozen No. 9½, 240 dozen No. 10, 356 dozen No. 10½ and 88 dozen No. 11, all of stock number B1189, Black. A separate sheet should be used to record the stock on hand of each color. This form is for the black only, and where additional colors of the same grade are manufactured, such as tan, blue, and white, the stock of these colors should be recorded on its proper sheet. To keep all the colors on one sheet would partly defeat the purpose for which the record is maintained. Different grades should also be kept separately. For instance, if the stock number of another grade were C234, it would be necessary to keep separate records of this grade.

HOSIERY STOCK RECORD

Men's Light Weight Color---Black Stock No. B1189

		9 1/2			10			10 1/2			11		
Date	Invoice	Shipped	Sold	Balance	Shipped	Sold	Balance	Shipped	Sold	Balance	Shipped	Sold	Balance
11-1	On hand			170			240			356			88
11-2	987	100		270	80		320	74		430	30		118
11-3	List		208	62		190	130		200	230		92	26
11-4	988	50		112	60		190	70		300	50		76
11-6	989							100		400	40		116
11-7	996	50		162	90		280						
11-8	998							50		450	70		186
11-9	1001	100		262	20		300						
11-10	List		81	181		210	70		324	126		75	111
11-11	1004	20		201	150		220	30		156	20		131

November 2—On this date there were shipped to the commission house the following quantities of stock No. B1189, black: 100 dozen No. 9½, 80 dozen No. 10, 74 dozen No. 10½, and 30 dozen No. 11. The date and the invoice number, 987, are entered in the proper columns. The quantities shipped are then entered in the Shipped column and also added to the previous balance in the balance column, which will be the correct current balance of stock on hand. With ordinary care used in the adding of these balances, the figures will always be correct. It is probable that Invoice 987 records the shipment of other grades and

colors also, but those will be entered on their correct forms in the Stock Record Book.

November 3—On this date the selling agents rendered a list of Account Sales, showing the detailed sales for the week. As a rule these are rendered once a week, except by special arrangement they may be rendered more frequently. From this list of Account Sales the bookkeeper tabulates the sales of the different colors and sizes and enters the total sales figures in the Stock Record. From this list it appears that the sales for the week were 208 dozen No. 9½, 190 dozen No. 10, 200 dozen No. 10½, and 92 dozen No. 11, of Stock No. B1189, black. These sales are entered in the sold column and are then substracted from the previous balance in the balance column leaving the correct current balance.

The other invoices and sales entered on this form are self explanatory and are taken care of in the same manner as those for which explanations were given. These additional figures were merely entered to give a good working size illustration.

At the end of each month the balance shown in the stock record must be compared with the stock on hand list furnished by the commission house, and after being certain that the amounts are correct, the shipments and sales should be added to show the total of each for the month. The sheets should then be ruled and the current balance brought down as of the first of the following month. It would not be impossible to keep additional columns for each size in which the value of the stock could be listed, but this is seldom desired. When the value of the stock is required this can be readily ascertained by a clerk in a short time by adding the balances and calculating the value at the current prices.

Some manufacturers claim that the keeping of a perpetual stock record is unnecessary under the assumption that the "Stock on Hand" figures of the commission house are correct. It would be just as logical for the business man not to keep a cash account to record his receipts and expenditures under the assumption that the accounts of the bank can not be wrong. Manufactured products are of as much importance as actual money, because actual money value was expended in their production.

TO BLEACH COTTON HOSIERY.—Cotton hosiery should first be boiled out with alkali in a kier or washing machine for three or four hours with 2 per cent caustic soda and 2 per cent soda ash, calculated on the weight of the goods. The goods must then be thoroughly washed, and then treated with a chloride of lime solution of 1½ degrees Tw. This treatment must be carried out in the cold for 1½ hours. Be sure to keep the goods immersed in a liquor during this time. A thorough washing must then be given with plenty of clean, fresh water. Then treat with a bath of sodium bisulphate, using 5 per cent of the liquor on the weight of the goods. The bath is used cold for half an hour. A very thorough washing must then be given, and the bleaching is finished. If a bluish tint is desired, a final bath may be given in which a small amount of bleacher's tint and 2 per cent of cotton softener may be used. The bath must be maintained at a temperature of 120 degrees for half an hour and then extracted.

Calculations for Knitted Fabrics.

BY WILLIAM DAVIS, M. A.

In connection with glove manufacture the warp loom has assumed greater importance during the past two years because the supplies of gloves made from this fabric have been cut off and merchants are looking for some means of securing the continuance of their supplies. This has caused the manufacturer and machine builder to be on the alert also and greater attention is being given to the more extensive development in the use of these fabrics. Machines are being introduced and the new branches of glove fabric production taken up with more or less success. This is usually done by the knit goods manufacturer, but it must be stated that for the average maker of knit goods the starting of a department for the warp loom product is not quite so easy as it would appear on the surface. A maker of underwear can turn his attention to the manufacture of hose and half hose or sweater coats without great effort, but when it is a matter of the warp loom product, the essentials are not so clear. In the first place skill in making the plain knitted fabric and its variations is not of direct use in mastering the mechanism of the warp loom machines, for these require an entirely new type of specially trained worker. The machines are usually introduced in small numbers and as they are sometimes not sufficiently important to insure the establishing of a new department, they are given into the care of the ordinary overseer. The latter, perhaps, does not possess the taste for mechanism or the adaptability to tackle the new machine and when it sticks, as it is sure to do before very long, the services of a mechanic from a distance have to be requisitioned, which spells loss of time and meagre production.

Another difficulty which has to be encountered by the knit goods manufacturer is that of dealing with the warps, for in his ordinary routine he has nothing to correspond with these. Considered from this point of view, indeed the warp loom and its fabric would seem to be more in the province of the maker of woven stuffs than for the knit goods manufacturer. In dealing with the warps and all the arrangements of warping and beaming the maker of woven goods is much better qualified than the knit goods maker and some have found it of advantage to send the yarns and instructions to a factory for woven goods and have the warps beamed and warped there and afterwards transferred to the knit goods factory to be knitted on the warp looms. In dealing with this trade, calculations relating to the weight and cost accounting of the warps are involved and we desire to deal with the most useful of these.

Before applying the calculations to the production of warp loom fabrics in particular it will be advisable to examine the formulae which apply to obtaining the particulars for all warps, the formula for which can be built up on the following lines.

If the case of a single thread be considered, say 10's cotton counts, the length of which is 84 yards and of which it is required to find the weight. $10 \times 840 =$ yards in 1 lb. of this count of yarn. By proportion the weight of 84 yards would be $84 \div 840 \times 10 = 1/100$ lb. To obtain the weight of 1000 threads we only require to multiply this formula by 1000 giving $84 \times 1000 \div 840 \times 10 = 10$ lbs.

weight. This is the weight of 1000 threads of 10's cotton each of which is 84 yards long and this is exactly the calculation involved in obtaining the weight of a warp with those particulars so that the formula for finding the weight in pounds of any warp is given as follows:

Length $\times$ Ends $\div$ Basis $\times$ Counts $=$ Weight.

Example 1. The warp for a knitted warp loom product is of the following particulars, find the weight of materials required: 240 yards long, 960 threads of 2/24's worsted counts. Using the formula we have: $240 \times 960 \div 560 \times 12 = 240 \div 7 = 34\ 2/7$ lbs. as the weight of the warp. Thus if it is required to find how many such warps can be produced from 720 lbs. of stock it is given by $720 \div 34\ 2/7 =$ 21 warps. In practice, however, it would be found that no more than 20 complete warps would be obtainable on account of the waste of yarn involved in the operations of beaming and warping. In such calculations it is usual to make an allowance or deduction under this heading.

The formula which has just been devised from first principles can, of course, be used in the form of an equation for the purpose of finding out other particulars regarding warps which may be required. Using the first letter of each of the above terms it stands thus:

$$(1)\ \frac{L \times E}{B \times C} = W.$$

By transposing the equation we have the following variations:

$$L \times E = W \times B \times C$$

$$(2)\ \frac{L \times E}{W \times C} = B.$$

$$(3)\ \frac{L \times E}{B \times W} = C.$$

Similarly we obtain:

$$(4)\ \frac{W \times B \times C}{E} = L.$$

$$(5)\ \frac{W \times B \times C}{L} = E.$$

These evolutions will be quite clear to any who understand the meaning of the original as an equation but for the benefit of those to whom the matter of equations is not quite so evident, we may translate the various portions thus:

$$(2)\ \frac{\text{Length} \times \text{Ends}}{\text{Weight} \times \text{Counts}} = \text{Basis.}$$

$$(3)\ \frac{\text{Length} \times \text{Ends}}{\text{Basis} \times \text{Weight}} = \text{Counts.}$$

$$(4)\ \frac{\text{Weight} \times \text{Basis} \times \text{Counts}}{\text{Ends}} = \text{Length.}$$

$$(5)\ \frac{\text{Weight} \times \text{Basis} \times \text{Counts}}{\text{Length}} = \text{Ends.}$$

These formulae will cover most of the questions which arise in connection with the warp loom fabric trade and a few examples will be given to illustrate their use. To obtain any one particular of the warp mentioned, the remaining four items must be known before the formula can be employed. That is, given any four of the requisite items, the fifth is always forthcoming by an application of one or another of these formulae, and by the simple operation of substituting the figures for the word corresponding. In using this formula it should be clearly understood that the weight of the warp must be quoted in pounds and the basis or standard must be given as hanks or cuts of a given length of yards which weigh one pound.

Example 2. Find the weight of a warp loom warp made on a machine which is set with 36 points per inch and has 72 inches width of fabric, 120 yards long composed of 12's worsted count. Every third point of the guide bar is left vacant.

With 36 points per inch and one third vacant we have 24 points per inch which are actually taken up with the yarns of the warp and as this extends over 72 inches of width, the total number of threads in the warp is given by $24 \times 72 \times 120 \div 12 \times 560 = 20\ 4/7$ lbs. weight of the warp.

If it is required to find out how many such warps can be obtained from a consignment of 1200 lbs. of this material, it would be given by dividing 20 4/7 into $1200 = 1200 \times 7 \div 144 = 58\ 1/3$ warps. That is we would obtain some 58 complete warps from this weight, one third of a warp or equal to about 7 lbs. of yarn would be left over. In practice, however, it is found that more waste is inevitable in making the warps. A certain length of warp is required to attach to the warping mill and in starting and finishing the fabric, a certain percentage has to be allowed.

Example 3. It is required to make a warp on a 30 point warp loom, 64 inches wide, all points being occupied with a yarn equivalent to 2/40's cotton. There are 75 lbs. of material. Find the length. Using formula 4 the calculation becomes: $75 \times 340 \times 20 \div 30 \times 64 = 656\ 1/4$ yards of warp. If this length were broken up into a number of warps and it was found that the waste were covered by an allowance of 5 per cent, then the total length would be 656 1/4 yards less 5 per cent $= 623\frac{1}{2}$ yards.

Example 4. Calculate the weight of a warp loom fabric which is made with a ground material of 2/40's worsted count in one bar, and an embellishing thread of 40/2 spun silk counts in a second bar. The machine is arranged with 30 points per inch, of which 10 per inch are occupied with the silk and 20 points per inch with the worsted ground. Find the weight of material for a warp where 150 yards of worsted is required with 200 yards of silk. Width 60 inches. For the worsted the formula is $150 \times 20 \times 60 \div 20 \times 560 = 16$ lbs. approximately. The silk is given by: $200 \times 10 \times 60 \div 40 \times 840 = 3\frac{1}{2}$ lbs. The two materials together will give a total of $19\frac{1}{2}$ lbs. If there were an ample supply of the worsted and only a limited amount of silk, say 16 lbs., it might be required to find out the length of warp which could be obtained from this amount by using the particulars of the silk warp along with formula 4: $16 \times 40 \times 840 \div 10 \times 60 = 896$ yards. But this would not give 896 yards for the worsted, as this is only required in the ratio of 200 silk to 150 worsted. The corresponding length of the worsted would be given by: $150 \times 896 \div 200 = 672$ yards.

In warp loom fabrics the take-up of one constituent of

the warp in relation to the other sometimes shows a wide divergence, because of the great freedom of movement allowed to the individual bars of the machine. In this lies the secret of the great success of the warp loom fabric, for on the machine the bars can be arranged several in number and in each bar is placed a different class of material which is worked into the fabric with the greatest scope of variation. We have usually the ground making a plain vandyke stitch which has great stability and on which can be placed the more fancy elements of the fabric design. These embellishment yarns may be chosen without the slightest regard to the matter of suitability or conformity of the yarn sizes in relation to the counts of the ground threads, for if they differ greatly they can be placed on a separate beam. We have used on the same ground thick chenille counts of a brilliant hue spread over the face of the cloth with the greatest freedom of style and pattern. Effective silk stripes are placed on the ground and so can give their maximum of effect without being obliged to intersect deeply as in the woven cloth. Similarly we may have certain features of the cloth introduced at the border only, and the guide bars in which such threads are placed, are threaded at the sides, the points being empty throughout the ground of the fabric. This makes a bordered fabric such as is required for shawls with the merest fraction of the trouble involved in making the competitive fabric on the Jacquard weaving loom. It is in these great conveniences in which it has come to outweigh the Jacquard fabric in many lines of trade and the usefulness of the warp loom in this respect will only be realized with a greater use of the machine and greater attention being paid to its mechanism, and its scope for patterning.

In imitating any pattern made on these lines with a variety of materials and with different take-up of the warp during weaving, it becomes necessary to determine the take-up before placing the material in the loom, if the various elements are to finish at approximately the same time and unnecessary waste is to be avoided. This can often be done by drawing the looser elements from the fabric and measuring the length in comparison with that of the ground.

Example 5. A warp is found to weigh 25 lbs. and the length measures 168 yards. There are 750 threads in the warp, find the count of the yarn in the skeins system (256 yd. hank). This is done by using formula number 3 and by substituting the figures for the words we have: $168 \times 750 \div 256 \times 25 = 20$ skeins of yarn approximately.

Example 6. A warp weighing 36 lbs. of 6's skein yarn is found to measure 96 yards, how could you find the number of ends without counting them? This is performed by the use of formula number 5 from which, substituting, we have: $36 \times 256 \times 6 \div 96 = 576$ ends or threads in the warp.

Find the ends in the warp of 28 lbs. of 2/32's worsted counts which measures 140 yards. By the formula: $28 \times 16 \times 560 \div 140 = 1792$ threads.

Example 7. Find the length of a warp which weighs 28 lbs. of 8's skein counts, 864 threads in the warp. Using formula 4 we obtain: $28 \times 256 \times 8 \div 864 = 66.4$ yards in length.

If this warp were put into a machine of 18 gauge, that is one having 18 guide points per inch, the width of fabric produced would be given by $864 \div 18 = 48$ inches wide. If every third point of the machine only were occupied, then this would be equivalent to 12 points per inch which would bring the width out at $864 \div 12 = 72$ inches in width.

(To be continued.)

The Knit Goods Market.

The strength of the hosiery market is shown in the fact that the announcement that Great Britain had declared an embargo on importations of cotton hosiery caused only a passing flurry. It was the suddenness with which the prohibition was put into effect that startled manufacturers, rather than fear of any disturbance of prices.

Philadelphia and adjacent territory was harder hit by the embargo than any other section of the country, and it was not long before mill representatives met and protested, calling for a modification of the prohibition so as not to include hosiery manufactured and in process of manufacture for British account, much of which was ready for shipment under special packing.

One effect of the ban on hosiery shipments to the United Kingdom was the appearance in mills of self-supposed shrewd buyers, who sought to create the impression that lessened export business would work toward a surplus and lower prices. So far as information is obtainable, not a manufacturer swallowed the bait, and the price tendency still is upward.

A mill specializing in high grade 84 needle socks made from clean yarn, for workmen, announces an advance to 75 cents, two pound basis. This is a decided jump, but has not checked buying.

A central west line of ladies' mercerized, 300 needle hosiery, has been marked up to $2.75 a dozen, which is 40 cents over the opening price. The line previously had been moved up to $2.50.

Similar advances have been announced in a number of lines, and they are being adhered to with a determination that offers a striking rebuke to interests that sought to unsettle the market because Great Britain no longer wanted our hosiery. Had the recent exportations to the United Kingdom represented an enormous volume of business, a very desirable effect of the embargo would be the enabling of mills to catch up with the demand for domestic consumption.

Some few mills were stunned when first the intelligence of the shutting of British ports to hosiery was received. To a mill in Reading, Pa., it meant cancellation of an order for 12,000 dozen pairs. Other mills were similarly affected, and not a few were notified of cancellation of Canadian orders.

The Wildman Manufacturing Company, Norristown, Pa., was quoted some weeks ago as stating that England and Canada had beeen buying very heavily of American knitting machinery. A large per centum of the production of Scott & Williams machines is known also to have been taken in both England and the Dominion. It is the belief in the trade that Canada will increase her business in the United Kingdom, and that for the present considerably less hosiery will cross our northern border than in the last year.

But every manufacturer who has lost an order through the placing of the embargo, can find an immediate outlet for any surplus with which he may be left, and it is not im-

KNITTERS

We are considering incorporating in this Knitting Section of COTTON a discussion department for knitters. As such a department would have to be operated by the readers of this section in the same manner as a similar department, entitled "How Other Men Manage," is utilized by the cotton spinning and weaving readers, we would require your cooperation. Therefore, we desire your advice.

Do You Want This Discussion Department?

Name several subjects that you would be interested in seeing discussed and several on which you would be willing to express an opinion.

REMEMBER—That all accepted letters are paid for after publication—

That while your name, position and address should be given with all communications, these are for our information only and will not be published—

That questions, answers or letters need not conform to any particular style and will be properly edited before publishing—

That the editor does not hold himself responsible for any statement or opinion or fact which might appear in this department unless so indorsed.

Let us hear from you.

Address
THE EDITOR

probable that the closing of British markets will be a blessing to domestic jobbers.

The most serious phase of the hosiery situation is the unwillingness of mills to make delivery against orders taken months ago, some of them as early as January. An ugly feeling between the manufacturing and distributing interests is being engendered through the demands for merchandise that are being met with indifference, if given any consideration at all. In a number of instances jobbers and agents are withholding payments, asserting that they will not pay for what has been delivered until shipment of unfilled orders be resumed. On the other hand, mills are refusing to ship until paid for what already has been delivered. There are deadlocks innumerable that it seems likely will reach the courts.

Mills appear to be having the better end in these controversies. It has been well established that a seller is justified in refusing delivery when the buyer refuses to liquidate a past due account. The average manufacturer can show that he cannot conduct his business if deprived of working capital by neglect of his customers to make their remittances with reasonable promptness, and that under such circumstances it was necessary to sell on more profitable terms to avert financial distress. In the present market it is not surprising that mills not financially strong are taking advantage of any pretext for abrogating a contract. One of the strongest reasons would be doubt as to a buyer's credit if the buyer were delinquent, so that it is commonly felt that in the final analysis the seller will come into his own and the buyer will be the chief mourner.

There is one phase of the manufacturer's abrogation that too many buyers overlook. In the last twelve months there have come shortened work days and lengthened payrolls, neither of which could have been foreseen. With many manufacturers it was a question whether to yield to force for an increase in wages, in order to keep plants in operation, or shut down. The alternative may have meant a serious loss; the latter excusable non-delivery. It is reasoned that the buyer should pass the increased cost along to his customers, to be borne ultimately by the consumer, rather than let it be borne by the manufacturer who, had he been able to foresee the attitude of the merchant, probably would have refused the wage increase and closed his mill.

Some mills have experienced little difficulty in getting prices better than those named in the order, to meet new conditions imposed by the war and unwise legislation. The trouble with most of the others is that they lacked the courage to go to their customers with a plain statement of facts, and sought to shirk their obligations when given an opportunity to profit pecuniarily by doing so.

With the market firm and prices strong, the hosiery trade never was so chaotic as at present, and the situation is one that is going to leave a bad taste.

Disquieting reports have come from Buenos Aires and Rio Janerio affecting two large houses, one of which bought approximately three quarters of a million dollars worth of knit goods, principally hosiery, in the United States in the last six months. Both houses are refusing to take in merchandise; one suddenly withdrew its credit from a New York bank and is protesting drafts.

The disclosures as to this latter establishment are causing about as much concern as the prohibition of hosiery imports into the United Kingdom, and one result will be that South American credits will be more carefully looked into than formerly and there will be less disposition to do business in the Latin republics, except through financially strong domestic exporting agencies.

A question in the minds of many persons is whether South American merchants already are not swinging back to overseas sources for supplies.

There is evidence that the hosiery industry is being planted in the republics south of the Gulf of Mexico. Enrique Weissenberg, who has been spending some time in Philadelphia, has established a hosiery mill in Quezaltenango, Guatemala, his home city, and is making a complete line for both sexes of all ages. He reports that a similar establishment is in operation in the capital city of Guatemala, and that recently an underwear mill got under way.

Mr. Weissenberg, of German birth, has lived in Guatemala 25 years, engaged as an exporter and importer, trading mainly with Germany. He says his reason for manufacturing hosiery, instead of importing from the United States is that American wages make American hosiery prohibitive in the Central American republic. He purposes spinning cotton yarn for his knitting mill, and if the venture proves successful, he says, he will install a mercerizing outfit. He is having difficulty in getting yarn deliveries and therefore will introduce spinning as part of the infant hosiery industry in Guatemala. His yarn experience is similar to that of many manufacturers here.

Delayed deliveries of yarn may be ascribed in many cases to the same reasons that prevail in non-delivery of knit goods. A Philadelphia spinner, during a slack period, had made up yarn for several customers, including 20,000 pounds for a central west mill, deliveries commencing in June. Recently he had to be called to account, shipments having ceased in July. His explanation was that in April a tempting war order came along. He cleaned up what had been made on the previous order, expecting to catch up, but help got scarce and only part of his mill could be kept going. Now he is making delayed shipments to escape law suits.

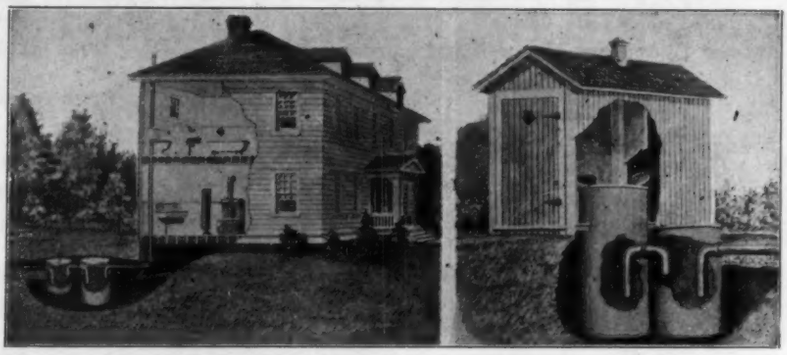
Pennsylvania hosiery manufacturers are moving for a lower compensation insurance rate. The present rate is 36 cents for each $100 of pay roll. From the showing made before the State Rating Board recently, it is expected a material reduction will be granted.

Of approximately $25,000 a year collected in premiums from 119 mills over $3,000 is required for paying compensation and medical attendance, while more than $10,000 goes to the insurance companies' expense account.

One of the better known Southern hosiery makers, who visited Philadelphia recently, is declining orders for export. First, he says, he has no room for additional business, and furthermore, he regards home trade as preferable—easier to please, easier to watch as to credits, and more stable. He said: "I am increasing my domestic business and aim to hold on to it. Other mills may have all the export trade that I might be able to take, and I will not envy them."

R. C. Aycock spent several days in Philadelphia, completing purchases of equipment for a dye house that is being erected as an auxiliary to the Aycock Hosiery Mills, South Pittsburg, Tenn. He also is buying knitting machinery for the enlarged mill, which is to have a capacity of 3,000 dozen a day.

Other manufacturers from the cotton zone who dropped



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THE perfect System for mill villages, suburban homes and schools, with or without running water.

VASTLY SUPERIOR TO ALL OTHERS

"SANISEP" Tanks are made of reinforced concrete with solid bottom and are thoroughly waterproofed to prevent seepage. They require no cleaning out, no chemicals, are absolutely fly proof, and will never become offensive.

They employ the L. R. S. or two-tank principle of sewage disposal, which was devised and is recommended by the United States Public Health Service, and which is recognized as being the most efficient known.

Write for catalogue and find out how economically your house or mill village can be made sanitary, and free from disease-carrying flies, before the hot weather comes.

The Cement Products Co., Wilmington, N. C.

Manufacturers of "SANISEP" Tanks.

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Frost Proof Closets

Quarter of a Million giving satisfaction. Save Water; Require No Pit; Simple in the extreme. The most durable water closet made. In service winter and summer.

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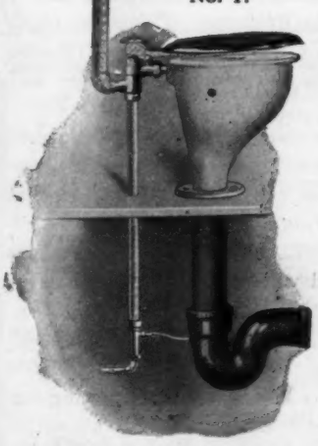

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Strong hardwood seat.

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Malleable seat castings will not break.

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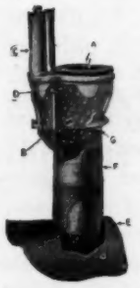

Skeleton diagram of toilet and system.

Inaccessible toilets—loitering—time wasted—unsanitary conditions—spread of diseases—frozen water pipes—clogged drains! All these conditions—and too many more to mention—occur in many a plant. Profits leak unaccountably until some clear brain discovers the true remedy—

Sanitary Sewerless **Kaustine** **Also Urinals**

WATERLESS CLOSETS

Here is perfect, sanitary sewage disposal without drains, water or cesspool. The Kaustine System is a wonderful invention, using special chemical agencies. It is modernizing toilet facilities in factories, colony houses, public buildings, railways, steamboats, construction gangs, outdoor assemblies and rural homes.

While Kaustine outfits conform to the generally accepted style in appearance—the resemblance ends there. Sewage is vented down through drop tube F into a special "Armco" iron tank E, where complete chemical disintegration, sterilization and disinfection immediately takes place.

The bowl and drop tube are thoroughly aerated (oxidized) by the fresh air which is continually sucked through the vent flue C. No germs can live in any part of this system—nor can any odors penetrate or remain in the toilet room.

The success of the Kaustine System is wide-spread, and its adoption by many more big business men assured by the results it is now giving. Every part of the System, even to the service, is guaranteed.

Our engineers are at your service in designing installation. Write for special catalog and state whether for factory, colony houses or homes.

KAUSTINE CO., Inc.

Dept. 1140 **BUFFALO, N. Y**

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in about the same time included Garnett Andrews, of the Richmond Hosiery Mills, Chattanooga, Tenn.; C. H. Bacon, Loudon (Tenn.) Hosiery Mills; W. B. Davis, of W. B. Davis & Sons, Fort Payne, Ala., and George T. Andrews, of the Enfield (N. C.) Hosiery Mills Co.

George T. Andrews brought little solace for his northern competitors who hesitated to load up with yarns, lest they be caught with high priced supplies. He told them at the Manufacturers' Club that he was looking for 20 cent cotton. Developments since his departure have not detracted from his prestige as a prophet.

A preliminary call has gone out for a meeting of the Knit Goods Manufacturers of the Central West, to be held December 5, in either Chicago or Milwaukee, the selection of the city to be left to a referendum vote of those interested. In view of the protest of the National Retail Dry Goods Association against any reduction of the cash discount and the widespread abuse of discount terms by many merchants, it is not unlikely that action looking to a standardizing of the cash discount and enforcing closer observance of trade terms will be taken at the Central West meeting.

Later in the winter the knit goods manufacturers of the South probably will repeat last year's sectional meeting, which was held in Charlotte, N. C., in February. These meetings, open to all, are held under the auspices of the National Association of Hosiery and Underwear Manufacturers.

Moves Main Office to New York.

Scott and Williams, Inc., the well known builders of knitting machinery whose main office was located at 88 Pearl street, Boston, Mass., have removed their headquarters to their New York office at 366 Broadway, discontinuing the Boston office. The New York office was opened on October 23rd and the routine work of changing is going rapidly forward. All future correspondence should be addressed to the New York office at 366 Broadway.

Packing for Export.

British, French and German shippers have reduced the packing of goods for export to a science. They have spent years of time and money to learn how goods must be packed to arrive in marketable condition, and they have learned to know the value, direct and indirect, of good packing. There's money in good packing.

Cloth-back, waterproof case-lining has been a staple packing material in Europe for fifty years. No matter how strong a shipping case may be, it is always lined with cloth-back water-proof paper.

The American novice in export trade generally buys what his paper dealer offers. The paper dealer usually stocks only the cheapest grade of water-proof case-lining—the coated-on-one-side kind, and he says that it is "good enough." It is not. Do your own thinking. Inadequate packing is dear at any price.

In overseas shipments, salt water, rain, snow, sleet, moisture, dampness, humidity, tropical heat mildew and other climatic conditions as well as dirt, smell and vermin are the elements to which goods will surely be exposed in transport and store, and which the shipper has to guard against.

The Safepack Paper Mills, Brockton, Mass., manufacture water-proof wrap-stuff and case-lining for farseeing shippers. They will mail samples of all grades and prices, as well as a booklet on Safe-pack paper for the asking.

Among the Knitting Mills.

The Griffin Hosiery Mills have been incorporated with a capital stock of $13,500 and will establish a mill to knit hosiery for women's wear. Machinery has been purchased and a building has been rented. R. P. Chapard, R. O. Crouch and J. P. Mason are among those interested.

The Crown Hosiery Mills, High Point, N. C., will build a two-story addition costing $15000.

The Signal Knitting Mills, Chattanooga, Tenn., has awarded contract for building the mill in which will be installed 56 knitting and 120 sewing machines, electric power drive. The daily capacity will be 700 dozen pairs of hose. Three hundred operatives will be employed. The company was incorporated with $150,000 capital stock and its officers are: H. M. Evans, president; Blair Finley, vice-president; W. A. Jones, secretary-treasurer.

The Ocala (Fla.) Knitting & Manufacturing Co. is considering increasing its capital stock from $50,000 to $100,000 and increasing the capacity of its plant; the company proposes to spin the yarn it now buys, manufacture shipping boxes and dye under-garments.

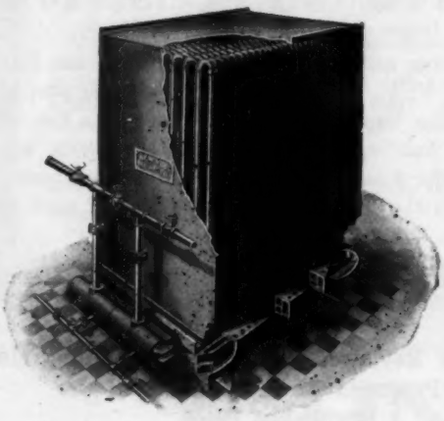
At an enthusiastic meeting of the Gainesville (Ga.) chamber of commerce, $1,000 was donated to secure the location of a new hosiery mill there that will operate 200 machines and give employment to 175 girls with a pay roll of $800 per week. W. F. Hetrick has gone to New York to buy the machinery for this new plant.

That the war has not interfered with new industrial enterprises in Canada is evident from the report that the Mercury Mills, Ltd., large manufacturers of hosiery and underwear, is erecting a new mill at Hamilton, Ont. The new buildings will be located on Cumberland avenue near the T. H. & B. railroad with which the plant is connected by spur track. All the mill buildings will be constructed of reinforced concrete, the flat slab or mushroom type of floor being used. The main mill, 191 ft. long by 91 ft. wide, will front on Cumberland avenue, and will contain three stories and a basement. The dyehouse, fronting on the same street, will be 179 ft. by 51 ft., three stories high. The picker house is to be a two-story structure, 67 ft. by 69 ft., located back of the main mill; and the boiler house, 50 ft. by 50 ft., is located behind the end of the dyehouse. The entire plant has been designed with an eye to future expansion. Charles T. Main, of Boston, Mass., is the designing engineer and architect.

The Winona Mills Hosiery Corporation has been formed at New Haven, Conn., to manufacture hosiery. The company will commence business with an authorized capital stock of $200,000. The incorporators are: Jefferson A. Simonds, Mabel S. Bartlett, and Andrew D. Saekeld. This company has taken over and will conduct the business of what was formerly known as the Columbia Hosiery Co.

The Amazon Knitting Mills, Muskegon, Mich., are building a one-story, 225 by 150-foot addition. At present 15,000 ring spindles, 241 latch needle knitting and 290 sewing machines are being operated on ladies' and children's cotton ribbed underwear.

Hot Blast Heating for Buildings and Factories



THIS Improved Sectional Heater consists of a number of coils enclosed in a sheet steel casing. The coils are constructed upon cast-iron bases, so divided by diaphragms that a positive circulation of steam is insured. All pipes are exactly the same length, they are screwed into the bases, and the upper end of each pair is connected by a return bend. All pipes being vertical, it is impossible for the water to remain in them.

The water seal at the rear end is a special feature, and is provided with a plug so that it may readily be cleaned should sediment accumulate.

By a simple arrangement of steam connections, either live or exhaust steam may be used in any portion of the coil.

Built in all sizes. Let our engineers solve your heating problems. Ask for catalogues Nos. 65 and 67.

The New York Blower Co.

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BUILT RIGHT
RUN RIGHT

What About Your Mill Office?

Is your office just a plain "cotton factory" office with worn-out furniture and inefficient filing systems, etc.?

Or is it a modern "Textile Mill" office, with up-to-date office furniture and "easy of access" filing systems—an office that has a brisk, business-like look to it?

Let us make your office up-to-date. We carry everything for the mill office,—desks, chairs, tables, Globe-Wernicke filing cabinets,—everything that is used in an office.

Our prices are right—our service is prompt.

Baylis Office Equipment Company

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FRANKLIN PROCESS COMPANY

291 Promenade Street, PROVIDENCE, R. I.

Machinery for dyeing yarns wound on parallel tubes.

Installations in Riverside and Dan River, Gibson Mfg. Co., Patterson Mills and others.

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Sole Agents in the United States and Canada for Platto Bros. & Co., Cotton Machinery.

COMPLETE MILL EQUIPMENT

Patent Barchant Machinery for Making Yarn from Cotton Waste, Etc.

PERFECTOL

A CHEMICAL PREPARATION FOR PREPARING GOODS FOR

BLEACHING AND DYEING

A Strictly High-Class Preparation for Cotton and Mercerized Goods and Artificial Silk

PERFECTOL—For Bleaching and Dyeing. For removing oil- grease- and iron-spots and all impurities from cotton goods. Acts as a softener and can be used instead of Turkish Red Oil or any other kind of dyeing oil. Causes the dye to penetrate the goods better, improves the bleaching process considerably, prevents fading of colors in finished goods.

PERFECTOL evens the dyeing colors and increases the lustre.

Directions: Use 2 to 3 pounds of PERFECTOL to 100 pounds of goods. In standing bath: one-half pound to 100 pounds of goods.

PERFECTOL is a useful and easily adopted article. Manufactured in U. S. A.

References and prices on application. Special prices for contracts. Further information cheerfully furnished.

Southern Chemical Laboratory

Chattanooga, Tenn. Wiehl Bldg.

The Johnson City (Tenn.) Hosiery Mills has been organized with $50,000 capital to build a plant for manufacturing women's hosiery. Details are now being arranged so that building and machinery contracts can soon be awarded. Officers have been elected as follows: Ben A. Morton, president; J. P. Roddy, vice-president; T. F. Dooley, secretary-treasurer.

The North State Knitting Mills, Durham, N. C., will build a $6,000 addition to their plant, and have awarded contracts. This structure will double the company's present space and enable it to add one hundred knitting machines. The contract for twenty-five of these machines has been awarded. The mills formerly operated an equipment of sixty knitting machines and ten loopers, the product being ladies' rib-top hose.

Machinery and equipment of the mill of W. W. Moyer, manufacturer of Swiss ribbed underwear at Ephrata, Pa., have been moved into the plant recently completed. This will adjoin the old building. It is 35x140 feet, three stories high. The old mill will be used for folding, packing and storage purposes.

The plant of the Wilde Knitting Mill Company of Hazleton, Pa., purchased by the Century Knitting Company, Inc., will in future be operated as a Hazleton branch of the Century Knitting Company, Spring City, ladies' underwear.

The mill formerly operating under the name of the Estate of Isaac Springthorpe, 4971 Wakefield street, Germantown, Philadelphia, Pa., manufacturing sweaters, etc., is to be known as the Ansty Knitting Mills, with B. and J. Springthorpe, proprietors. The mills are increasing their equipment.

The Crystal Hosiery Mills Company, York, Pa., manufacturers of seamless hosiery, who, as previously announced, have been compelled to build a large addition to their mills on North George street, state that the increased addition will have a floor space of about 4,000 square feet. While the top floor only will be used for knitting purposes, the other part of the building will be used for storage and finishing departments.

The Rockwood (Tenn.) Knitting Mills are reported to have purchased additional machinery for their plant.

Announcement has been made of the incorporation, under the laws of Delaware of the Black Cat Textiles Company, with a capital of three million dollars. This new concern, operated by the same capitalists who control the Chicago-Kenosha Hosiery Company, will absorb both the Black Cat Hosiery Mills in Kenosha and Sheboygan, Wisconsin, and also the Cooper Manufacturing Company of Bennington, Vermont, makers of Cooper spring needle underwear. The products of this new concern will be marketed under the "Black Cat" and "Cooper spring needle" brands; the manufacturing organizations of each mill will remain unchanged.

The organization of a company to establish a knitting mill is contemplated by Chas. R. Scarborough and associates at Conway, S. C.

The Hackettstown Hosiery Company, Hackettstown, N. J., has decided to establish a branch knitting mill at Berkeley. It has leased a suitable building and equipment will be installed in the near future.

H. C. Dwelle and associates are said to be promoting a company to establish a new hosiery mill at Charlotte, N. C. The initial capital will be approximately $50,000, with probabilities of increasing this at an early date to $100,000.

The B. Z. B. Knitting Co., Rockford, Ill., has awarded a contract for the construction of a four-story factory building to be built of reinforced concrete, 41x150 feet, at South Wyman and Green streets, at a cost of $50,000.

The pressing and knitting departments of the Fitwell Mill, Cohoes, N. Y., have resumed operations in part after being closed for several days as the result of a fire which damaged the building to a considerable extent. It will be about December 1 before the entire mill will be running as it was before the fire, which caused a loss of more than $10,000.

BOOK REVIEWS

All Books Reviewed Under This Heading May Be Procured From COTTON at the Published Price.

RAILWAY ORGANIZATION AND MANAGEMENT. By James Peabody, late statistician for the Atkinson, Topeka and Santa Fe Railway Co. 263 pages. Illustrated. Published by the LaSalle Extension University, Chicago.

A clear and usable book on this subject has long been needed, and Mr. Peabody's attractive volume will be found more than adequate. Railway administration involves so many and such widely varied subjects as to require for its successful conduct the largest possible survey as to commercial conditions, coupled with a knowledge of detail that takes into account all the varied operations incidental to the service. Properly to manage such an undertaking necessitates the employment of many men of many minds, and the plan by which homogeneity and efficiency are attained is known as railway organization. In this book the various departments are taken up in order—administration, engineering, operation, traffic, accounting, etc.—and the work of each and the arrangements for performing that work are clearly set forth.

It also discusses in a most interesting fashion the problems of all kinds which railroad men have to meet, from the occasional vagaries of lawmakers to the scarcity of wood for ties. Such vital topics as government regulation, valuation, education of apprentices, pensions, staff versus line control, reports, statistics, advertising, competition, track elevation, electrification, traffic associations, rate-making, inter-line billing, the management of great terminal stations—all have concise but illuminating treatment. So vast is the range of subjects and so incisive the handling of them that the volume may well be called the most attractive general introduction to the business of railroading that has yet been published. As noted, the book is issued by the LaSalle Extension University, Chicago, and forms part of the material of its course in interstate commerce.

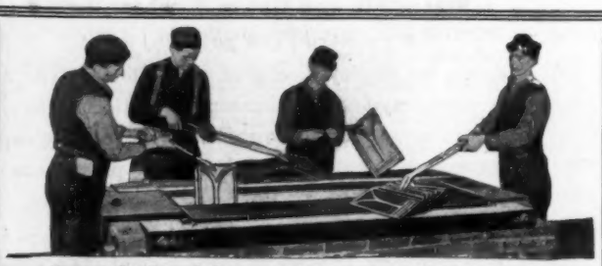
More people spent their vacations in National Forests this summer than have ever done so before, many persons traveling long distances by automobile in order to camp in these public playgrounds.

The Tape Drive

Our tapes are endorsed by machinery experts. They know their quality and they know their scientific structure. Exhaustive trials by practically all machinery makers have demonstrated that they have no superior. Write us.

Barber Mfg. Co., Lowell, Mass.

Spinning Tape Specialists



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By the Cortright process each shingle is *first stamped into shape*, from sheets of prime roofing tin, *after which they are galvanized by dipping each slate or shingle separately* into a bath of melted zinc, adding an extremely heavy coat.

See that your new home is covered with them. They're not only wear-proof but fireproof and stormproof as well.

They can be laid over an old wood roof without dirt, fuss or bother—and the price is just right.

CORTRIGHT METAL ROOFING CO., Philadelphia and Chicago

JOHN D. LEWIS

Manufacturer of

Logwood Extracts & Hematine

Providence, R. I.

50% Better than ever from YOUR Standpoint

SEVERAL NEW FEATURES have been added to the "1912" Cloth Cutting, Folding and Winding Machine which add at least 50 per cent to its value to YOU.

It will cut your cloth—fold the edges—roll it up and give you an exact measurement of every piece of cloth going through the machine.

It saves time, labor, machines and cloth.

YOU ONLY NEED ONE MACHINE where before it required two, and you get an extra strip from every bolt of cloth.

It cuts the corners of expense in every way and leads to more and greater profits.

THE ENORMOUS SAVINGS WILL INTEREST YOU.

Mail a card for complete information and prices.

When in need of special machinery, write us.

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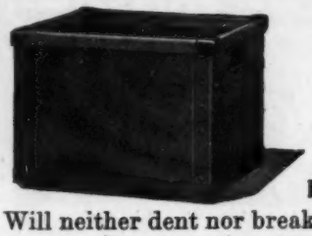
SPINDLE TAPES and BANDS



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MILL BASKETS
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Will neither dent nor break when subjected to hard usage. Stronger than wood, lighter than steel.

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A DETERGENT THAT'S DIFFERENT

It makes a better finish

ALUMINA

Booklet — *Free*

SOAPALITE

The Electric Smelting & Aluminum Co.

Sole LOCKPORT, N. Y. Mfrs.

Steam—In and Out of Slashers.

(Continued from page 10.)

valves should be employed, one of the ordinary type and one of a special type for the second reduction. The second reducing valve should have sufficient range to be capable in emergency of reducing steam at boiler pressure to the reduced pressure wanted.

By this means, when the demand is high, both valves will run with a relatively wide valve opening and close regulation. When the steam demand is small, with perhaps only one slasher running, the first valve will nearly or wholly close, and in spite of probable leakage the second one will perform the close regulation of which it is perfectly capable.

As a further precaution a safety valve of ample size should be installed and this valve must be capable of discharging the full capacity of the reduced pressure line at boiler pressure, which secures absolute protection.

In large installations two valves, one large and one small, may be installed, the small one having a close setting and the large one being set at a pound or two higher for emergency.

Under these conditions the individual reducing valves may be omitted and the final pressure reduction may be the slasher working pressure. The individual safety valves may be permitted to remain, but with the above protection safety depends only slightly upon them.

Faults commonly found which reduce the production of slashers are lack of proper facilities for draining the cylinder quickly and facilitating the escape of air in starting the machines in the morning. This results in considerable lost time in starting and is also liable to necessitate the occasional shutting down of the machine with a repetition of the process of starting when drainage accumulates in the cylinder.

Wet steam, which may be caused either by lack of proper drainage in the supply main or in the steam main from which the supply is taken, increases the amount of condensation which must be removed. If either the removal facilities or the steam supply pipes are inadequate, this must cause a limitation in speed.

The proper location and size of steam supply mains, their efficient drainage, both as to piping and traps, or other accessories, might be thought by some to be matters of common sense.

On the contrary they are matters of engineering and experience and well worthy of careful study if the best results are desired.

The size of mains required will be a surprise to many manufacturers; also the result of increasing mains and drains to a proper size. For the quick removal of air, opportunity must be provided for direct discharge so that air will be kept out of the system and not passed on to cause trouble farther along, but in securing this result no loop-hole should be left that will permit unobserved waste of live steam or good hot water through trap by-passes, etc.

Of the various kinds of apparatus which may be used for the removal of condensation, the old-fashioned "Pot" trap is the one most commonly found and is least suitable.

The first pre-requisite is a constant and uninterrupted discharge of condensation from each slasher, as fast as formed, which calls for liberal delivery from each slasher to a large accumulation space for the entire set. From this point gravity, a high pressure return trap, or a pump may be utilized to return condensation to the boiler room.

Motor valves may be used individually on each slasher, with excellent results if the subsequent delivery is properly provided for.

One of the least expensive and most satisfactory methods where local conditions permit is the loopseal. Here again, the proper design of the installation requires careful consideration of capacities, location, size of connection, etc., in fact, an expert knowledge of the subject.

Frequently slashers are operated by direct steam when exhaust steam from a non-condensing engine or bleeder turbine is available. Exhaust steam at 10 pounds pressure may be used if available with great economy.

Exhaust steam, properly drained to insure that it enters the slashers dry will be absolutely satisfactory, and if formerly wasted its reclamation will be a material economy inasmuch as the condensate may be returned to the boilers.

We frequently find the condensation from the slashers being run to waste because of the distance of the machine from the boiler room; but it is next to impossible to conceive any conditions in a mill operated by its own steam where the expense of returning condensation to boilers is not amply justified by resulting fuel economy.

Proper insulation of cylinder heads, steam mains and returns is common, but by no means the universal practice.

Proper covering means reduced load on mains and returns, more comfortable working conditions, and the fuel economy alone will pay an ample return on the investment.

A careful inspection of your slashers and dryers with all of the above in mind will well repay you. Make sure that you are safe from explosions.

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Curl yarn is defined by the Hosiery Trade Journal as a type of yarn produced in solid shades, or in varied colors, which presents curls or loops of various sizes all along its surface. It is usually produced as follows: Two threads, a thick and a thin, are twisted together, the thin being held tightly, and the thick or curl thread slackly twisted round it. This two-fold yarn is then twisted in the reverse direction with another thin thread, this untwisting throwing up the thick thread as a loop, the two fine threads holding the loops firmly.

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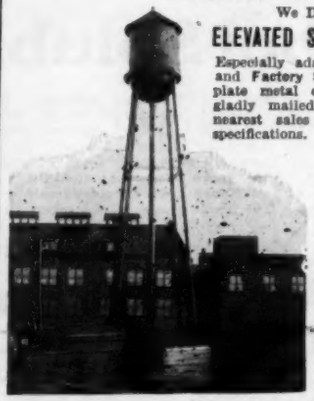

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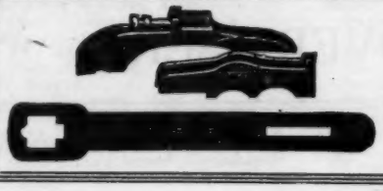

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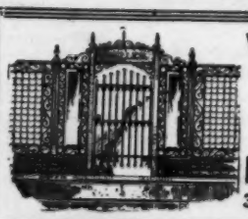

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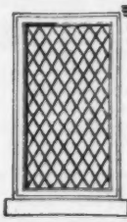

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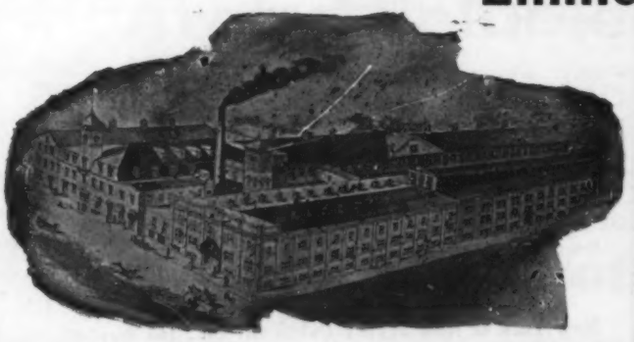

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MILL MACHINERY OF ANY KIND

If you have any broken machinery that needs repairing, and want the highest quality work at the lowest price we want your business. We make a specialty of reboring engine cylinders, valves, etc.

Our excellent equipment and facilities, combined with skilled workmanship, enables us to turn out quality work at the lowest prices, and assures you satisfaction.

All repairs handled promptly, and shipments made without loss of time.

The cotton mill castings that we make are of the same high quality—in brass, grey iron, etc. Send us samples or blueprints and let us estimate.

Write for full information.

GREENVILLE IRON WORKS, GREENVILLE, S. C.

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Providence, R. I.

Manufacturers of Loom Harness, Weaving Reeds,

Oak Tanned Leather Belting, Strapping, Etc.

WE MAKE A SPECIALTY OF HARNESS FOR WARP DRAWING MACHINES

NOTE—No orders too large for our capacity. None too small to receive careful attention.

STUART-HOWLAND CO.

Most complete line of

Electrical Merchandise

of every description.

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Ideal Surgical Dressing.

Powerful, Safe, Pleasant.

If your druggist cannot supply you write to us.

Send 10 or 25 cents silver for trial bottle.

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WILMINGTON, NORTH CAROLINA

The rate without display type for "Positions Wanted," "Help Wanted" and "For Sale" Advertisements of 40 words or less is one dollar an insertion; additional words, two cents each, payable in advance. Remittances and copy intended for any issue should reach this office not later than the fifteenth of the month.

Replies may be sent care of COTTON, Atlanta, Ga.

WANTED—An overseer of weaving experienced in the manufacture of army duck. Location South. Give experience and references in first letter. Address "B" care COTTON.

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One 20" x 12" Lathe
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Two 16" x 10" "
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One 13 x 10' Engine Lathe.
One Power Hack Saw
Marvel Power Hack Saws in stock for immediate delivery.

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AND SUPPLIES OF ALL KINDS

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COTTON AND WORSTED YARNS
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For Weaving, Knitting and all Purposes
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For Towel Borders, Towellings and Bleaching Cloth
Linen Jacquard Harness Twine
And Every Description of Linen Thread and Twine
115 Franklin Street, : NEW YORK

The Employee

who makes the most rapid progress is the one who knows the best ways and the best products to accomplish expense-saving results in his plant.

One of the easiest ways to find out about the best products is to continuously study the advertising pages of COTTON. See how many things you will find that will save time and money for your plant. Then act. You will be well repaid.

ESTABLISHED 1872
H. & B. BEER
NEW ORLEANS

HENRY BEER EDGAR H. BRIGHT
J. WILLIAM BARKDULL C. MORGAN ABRAMS

MEMBERS OF
New Orleans Cotton Exchange
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New York Cotton Exchange
New York Coffee Exchange
New York Produce Exchange
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600 Rooms
400 Baths

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Broadway, 32d St., New York

125 pleasant Rooms, with private bath, facing large, open court,
$2.50 PER DAY

157 excellent Rooms, with private bath, facing street, southern exposure,
$3.00 PER DAY

Also Attractive Rooms from **$1.50**

The restaurant prices are most moderate. Equally convenient for amusements, shopping or business. One block from Penn'a Station.

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It is situated within a short distance of the business, shopping and theatre districts, and is in close proximity to all railroad stations.

Single Room with Bath
$2.50 to $4.00
Double Room with Bath
$3.50 to $5 00

L. C. PRIOR,
Managing Director.

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On Broadway at 103d St., New York

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YOU'LL ENJOY EVERY MOMENT AT THE MARSEILLES.

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Write for booklet and map.

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America's Convention and Carnival City.

Fireproof

European Plan

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Center of business on Grand Circus Park. Take Woodward car, get off at Adams Avenue.

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200 Rooms, Private Bath, $1.50 Single, $2.50 Up Double
200 " " " 2.00 " 3.00 " "
100 " " " 2.50 " 4.00 " "
100 " " "3.00 to 5.00" 4.50 " "

Total 600 Outside Rooms.

ALL ABSOLUTELY QUIET

Two Floors—Agents' Sample Rooms

New Unique Cafes and Cabaret Exellente

Proper Locations for Cotton Mills.

United States Census figures show that since 1880 the consumption of cotton in mills of the cotton growing states has increased 1,502 per cent, as compared with an increase of only 93 per cent in all other states. In the twelve months ended August 31, 1915, Southern mills consumed 385,856 more bales of cotton than the mills of all other states. Three-fourths, or 9,000,000, of the total cotton spindles in the cotton growing States are tributary to Southern Railway tracks. Of the 200 knitting mills in the South over 125 are located along the Southern Railway. Nearly all the Southern woolen and silk mills are also on Southern Railway tracks.

There is a reason for this, and it is not difficult to understand.

The Southern Railway Lines enter and serve most completely those portions of the South where the textile industry is the greatest success, because there are found all the conditions which make for successful manufacture —the proper transportation facilities, the ease with which the raw materials and the needed fuel may be secured, the supply of good labor, the pure water, the low cost of power, and favorable local conditions.

Not only for textile plants but for all other industries the best advantages will be found in this territory.

If you have a plant to locate let us take up with you the question of the proper location. Your plans will be held confidential. Our knowledge of conditions at various points and our experience in locating other mills and the time of our agents in making special investigations are at your service, if desired.

M. V. RICHARDS

ROOM 131

Industrial and Agricultural Commissioner, SOUTHERN RAILWAY, Washington, D. C.

COTTON is a member of the Audit Bureau of Circulations. Copy of last statement sent on request.

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A LOCATION UNSURPASSED IN NEW YORK CITY.

This famous hotel has been entirely remodelled and refurnished, up to date in every appointment, and can now compare favorably with any hotel in the city.

It has the most convenient location, being within five minutes from the Pennsylvania and N. Y. Central Stations, within a few seconds of the leading theatres and department stores.

No other hotel on Broadway has such large and beautiful rooms at the rates of

$1.00 Per Day and Up; Rooms with Bath, $1.50 Per Day and Up.

$1.00 Additional Each Person.

VISIT OUR WORLD FAMOUS RATHSKELLER.

—"I wonder if we're spending it in the right mediums!"

¶ This little drama is enacted every business day somewhere by the men who furnish the money and direct the plans for the publicity of their product.

¶ Around that big director's table sentiment gives way to sense, facts are sought rather than fiction, exactness demanded instead of estimates.

¶ The advertising manager, the agent, the publisher all recognize the insistent and growing demand for circulation facts.

¶ "A. B. C. Service" supplies this information in a uniform, standardized, comprehensive, far-reaching manner — gives a definite gauge of just what your dollar will buy in any desired field or class.

¶ It is one thing to make a recommendation for an appropriation; quite another to have your recommendation justified by facts.

¶ Why not back up your plans with the knowledge and facts that "A. B. C. Service" places at your disposal? Its cost is but a fraction of the cost of doing without it.

A·B·C

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AUDIT BUREAU OF CIRCULATIONS
15 East Washington Street, Chicago

COTTON is a Member of the Audit Bureau of Circulations
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Liquid Chlorine
Simpler and Easier to Handle
Liquid Chlorine, the new Bleaching Agent, is far simpler and easier to handle than the old bleaching powder method. It is a neater, cleaner, more efficient and scientific method. No material changes in your present method of bleaching are necessary to adopt this new agent. It comes in steel cylinders. The cylinders are provided with valves which when opened allow the chlorine to escape in the form of gas, and this gas dissolves completely into a clear
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Yarns and cloth bleached with Liquid Chlorine have a much softer feel and a positive increase in the tensile strength of the goods is obtained. Less acid (or sour) is required, which eliminates tendering and also results in a large saving in the amount of wash water required. No odor is left in the goods.
Liquid Chlorine is more economical, and you save on freight charges also as 1 pound of Liquid Chlorine is equal to 4 or 5 pounds of bleaching powder.
Let us demonstrate Liquid Chlorine in your own mill. Just ask us to send a man.
Write today for booklet
Electro Bleaching Gas Company
18 East 41st Street NEW YORK CITY

In Your Spare Moments

study the advertisements of COTTON. Such study will broaden your knowledge of the best products for your plant. It will increase your value, both to yourself and to your plant.

STARCH

Textile Starches

In the manufacture of cotton goods a great deal depends on the proper use of starch. It is impossible to have good weaving and high production unless the warps are properly sized.

We have made a scientific study of the use of starch both by laboratory research and practical tests in the mills. As the result of this work we have determined what kind of starch produces the best results on the different classes of goods and we are now able to offer to the trade SPECIAL TEXTILE STARCHES adapted to every requirement of manufacture.

We are prepared to study your problems and show you how to obtain the best results on the particular class of goods you are making.

For Information Address

Corn Products Refining Co.

New York City

Southern Office

Greenville, S. C.

STARCH

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RECTOR 8840, 6662

CABLE ADDRESS
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Madero Bros.

Incorporated
Chemical Dept.

115 Broadway, New York

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SOLID LOGWOOD
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HEMATINE CRYSTALS
ANILINE DYES

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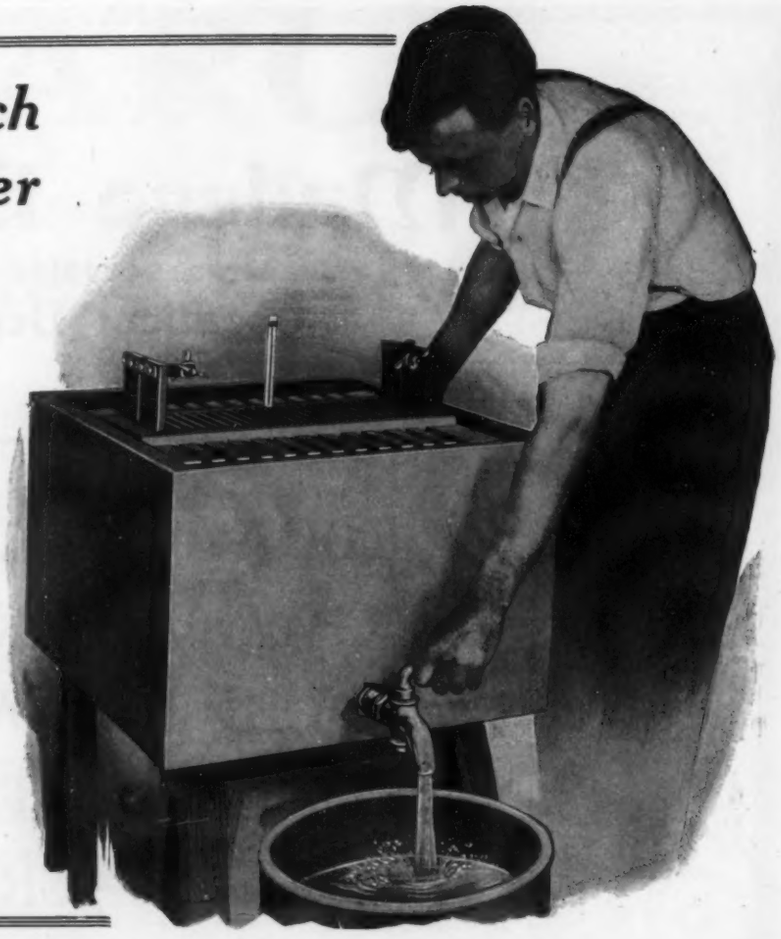
TARTARIC ACID
TANNIC ACID
ALL OTHER CHEMICALS

Make Your Bleach Out of Salt Water

WE manufacture a number of different types of cells for this purpose. All you require besides this is direct current of electricity and salt water.

Write for additional information.



Electro Chemical Company,

Formerly

National Laundry Machinery Co.

Dayton, Ohio, U.S.A.

VICTOR MILL STARCH

The Weaver's Friend

It boils thin—penetrates the warps—increases breaking strength and carries the weight into the cloth. Being thoroughly washed free of gluten and other foreign matter it gives a bleach and finish to the goods that you can get from no other starch.

A trial order will convince you that VICTOR STARCH has no equal on the market.

THE KEEVER STARCH COMPANY, Columbus, Ohio

Southern Agent: MR. JAS. H. MAXWELL, Greenville, S. C.

If you are not already using VICTOR STARCH call on our representative for a demonstration at your convenience.

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Prussiates

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Palm Oil
Soya Bean Oil
Castor Oil
Cotton Seed Oil
Red Oil
Etc., Etc., Etc.

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280 Broadway
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DREXEL BUILDING Telephone, Lombard 2186
San Francisco:
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The Warren Aniline Co.

Drexel Building, Philadelphia, Pa.

PHONE, LOMBARD 546

We offer the Standard Types of the principal foreign makers. And, at your service always.—

An efficient laboratory;
Sound financial responsibility;
Twenty years' experience in anilines;
Untiring effort to increase your account.

If your name is on our books, your feeling, in the matter of aniline costs, is one of confident security, as

WE HAVE ONLY TYPE COLORS; and——
AT LOW PRICES, FOR TYPE COLORS.

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Aniline Colors and Coal Tar Products

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SCHOELLKOPF ANILINE & CHEMICAL WORKS, Inc., Buffalo, N. Y.

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LYSTER
CREOSOTE
WOOD
PRESERVER
"NO-D-K"

A MEANS TO THIS END

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Soluble Grease

To make the stock, yarn or warps Run Smooth, regardless of dyes that make the Cotton Fibre harsh.

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100% Strength—20% Oxidation

Leads all other blacks in point of richness and depth of shade.
On proper handling it is as fast to light as fast top chrome black.
Goods dyed with Logwood are fast to milling and steaming.
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Our Logwood is of the highest tinctorial value, and is guaranteed pure.
Dyeing formulae and expert advice supplied on request.

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Bleach, Dye and Mercerize

All Kinds of Cotton Yarns and Threads in Warps and Skeins Also Winding on Quills, Tubes and Cones for all uses.

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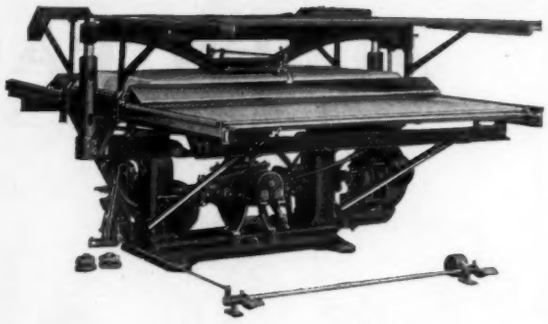

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The most profitable employee in the mill—through no special effort of her own—is the girl who operates the American Automatic Underwear Press.

In a day she turns out from 150 to 420 dozen suits of underwear—each one finished as though it had been hand ironed. Live steam leaves the nap of the goods in the finest condition, and not a suit becomes a "second" because of steam or water stains.

The work is easy. Pressure on a pedal causes the machine to perform its operation. The frames have only to be put in at one end and taken out at the other.

This machine is an earner of dividends the mill owner cannot afford to be without it.

Write now for further information

The American Laundry Machinery Company

Specialty Department

Cincinnati

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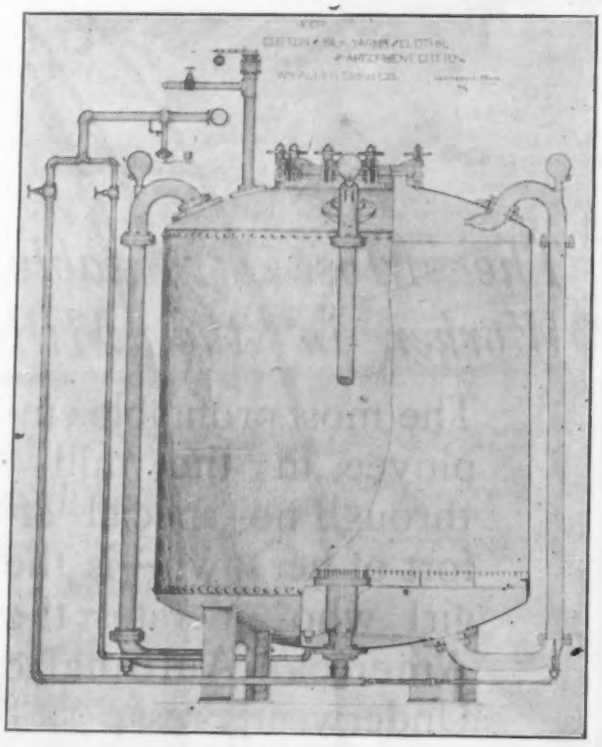

"Allen" Injector Kier
As illustrated
"Allen Worcester" Kier
Electric Driven Circulator and Indirect Heater.
"Allen Hydraulic" Kier
For Raw Stock. Unloaded in 30 minutes.

The following is an extract from letter from a large mill that recently installed **"Worcester" Kiers.**

"We note that in the new type kiers the liquor can be brought to a boiling point very much quicker than in the old type, thereby saving considerable time in the boil-off."

This new kier is mechanically correct, no live steam is admitted to the kier.
Absolutely uniform results are secured with less consumption of steam.
Let us show you how you can improve on your present system. Write us.

Logwood Extractor for Extracting the Coloring Matter from Logwood Chips.

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Cotton Warp on Beams, 1 to 12 Beams in One Operation
Special Machines for Aniline, Sulphur, Indigo, and Other Vat Colors

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OF EVERY VARIETY
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BOARDS FOR FAST BLACK DYERS.
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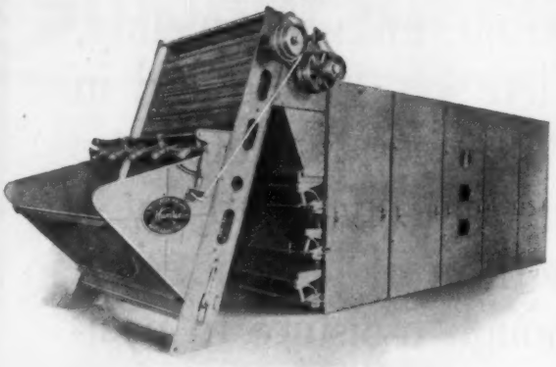
A Dryer Worth Knowing About



The Hunter

Agitating Table Dryer

THERE are many improvements in this dryer worth knowing about. It has no wire aprons and occupies less floor space, uses less power and steam than any other type. The drying table is of smooth, perforated sheet steel. Uniform treatment to each particle is obtained by constant agitation. Asbestos insulation throughout provides adequate fire protection.

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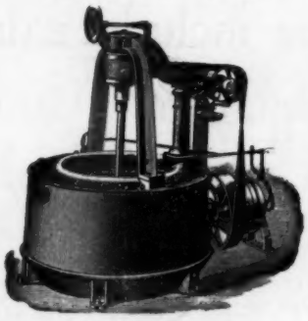
Sizes from 12" to 72"

Belt Engine or Motor Driven



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Also Direct Connected Electrically Driven

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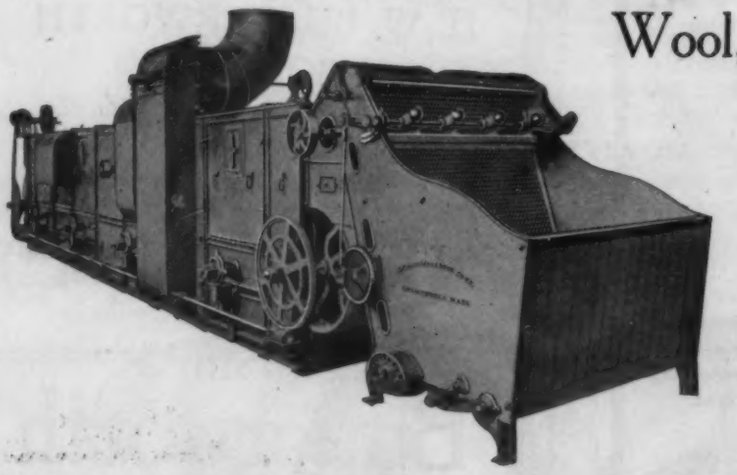

Tell us what you want to do and we shall be glad to give you every assistance possible.

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Capacities from 50 to 500 bs. per batch.

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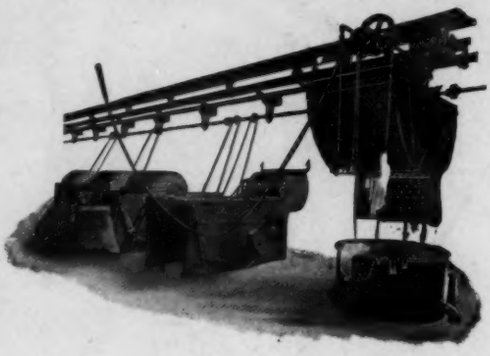

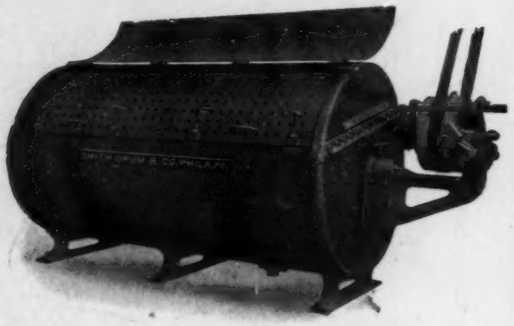

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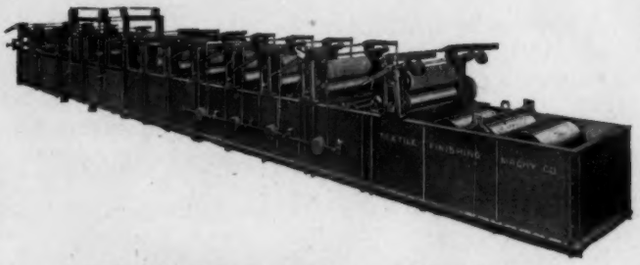

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Tenters.
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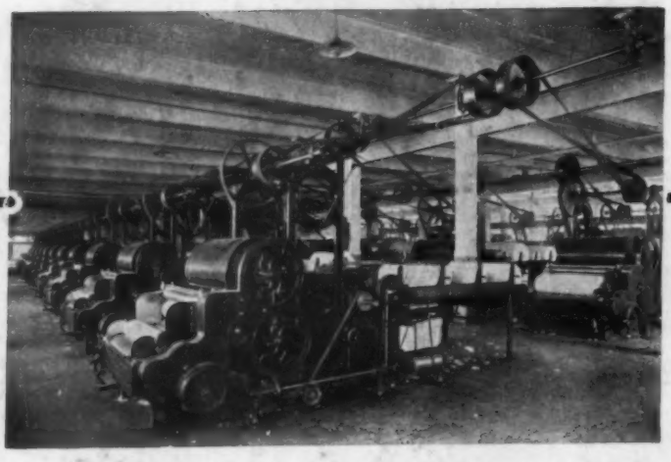

SKF BALL BEARINGS

Instalation of Cotton Pickers with Ball Bearing Beaters.

Remove the Friction—Save the Power

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Numerous tests on Pickers, Openers and Finishers, S. K. F. equipped, show an average saving of ¾ H. P. per Beater—in all cases the power saving has been in excess of ½ H. P., or over 10% of the total power consumption.

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AUTOMATIC RESPIRATOR

It stands for the health, strength and energy of your workers. That's both safety first and real efficiency.

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That Superior Finish
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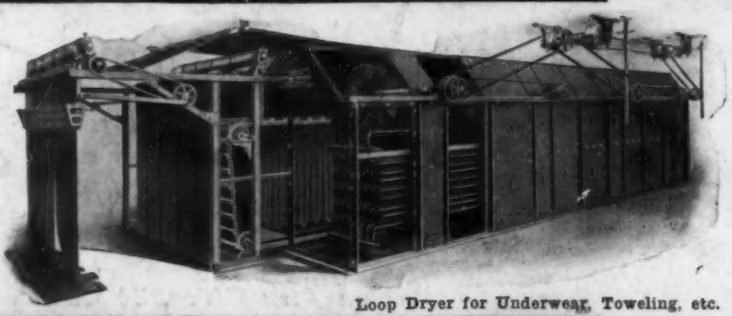
Cloth handled in this way, when cut into garments and finished on a "Hurricane" Hot Plate Press is given that Superior Finish that shows the quality of your goods to best advantage.



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